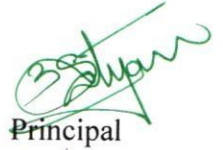


Dr. B. Satyanarayana

B.Tech., M.Tech., Ph.D., MISTE
Professor & Principal

AUTHENTICATION CERTIFICATE

This is to certify that the institute offers the Programme Outcomes and Course Outcomes for all programmes and displayed on website and evaluated the attainment of Pos and COs.



Principal

Principal


CMR INSTITUTE OF TECHNOLOGY
Kandlakoya (V), Medchal Road,
Hyderabad-501 401.



2.6.1 The institution has stated learning outcomes (programme and course outcome)/graduate attributes which are integrated into the assessment process and widely publicized through the website and other documents and the attainment of the same are evaluated by the institution

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Principal
 CMR INSTITUTE OF TECHNOLOGY
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 Hyderabad-501 401.

CMR INSTITUTE OF TECHNOLOGY

Vision: To create world class technocrats for societal needs.

Mission: Impart global quality technical education for a better future by providing appropriate learning environment through continuous improvement and customization.

Quality Policy: Strive for global excellence in academics & research to the satisfaction of students and stakeholders.

Department of Civil Engineering (CE)

Vision: To be a centre of excellence that nurtures technically competent civil engineers and promotes high-end research to meet the global challenges.

Mission: Provide fundamentals and emerging technical skills to design, build, operate and manage the infrastructure requirements of the society through education, training, research and consultancy.

I. PROGRAMME EDUCATIONAL OBJECTIVES (PEO's)

PEO1: Graduate will build successful career in the diversified sectors of the engineering industry and/or higher studies by acquiring knowledge in mathematical, scientific and engineering fundamentals.

PEO2: Graduate will plan, analyze and design civil engineering systems with societal responsibility.

PEO3: Graduate exhibits professional ethics, communication skills, teamwork and adapts to changing environments of engineering and technology by engaging in lifelong learning.

II. PROGRAMME OUTCOMES (PO's)

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.



5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
13. **PSO1:** Identify, understand, formulate and analyze civil engineering problems related to structural, geo-technical, hydraulic, water resources, transportation and environmental engineering towards R&D, professional, career and societal needs.
14. **PSO2:** Apply modern techniques, software's and multi-disciplinary knowledge for the design and execution of civil engineering projects within stipulated time and cost.

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Quality Policy: Strive for global excellence in academics & research to the satisfaction of students and stakeholders.

Department of Mechanical Engineering (ME)

Vision: To be a centre of excellence committed to provide quality education and research for nurturing technically competent and socially responsible mechanical engineering professionals



Mission: Provide state-of-art technical knowledge, research and consultancy in collaboration with industries and R&D organizations to meet the global and societal challenges in the field of mechanical engineering.

I. PROGRAMME EDUCATIONAL OBJECTIVES (PEO's)

PEO1: Graduate will have effective foundation in mathematics, science, engineering, technology, management, humanities and various other interdisciplinary subjects for successful career in mechanical engineering and related fields.

PEO2: Graduate will be able to pursue higher education and research and/or become an entrepreneur / innovator to design and develop mechanical systems to address technical, business and global challenges.

PEO3: Graduate exhibits professional ethics, communication skills, teamwork and adapts to changing environments of engineering and technology by engaging in lifelong learning.

II. PROGRAMME OUTCOMES (PO's)

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of



the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
13. **PSO1:** Apply Geometric modeling, Analysis and Simulation tools to design and develop mechanical engineering systems.
14. **PSO2:** Apply advanced techniques in manufacturing, thermal engineering and automobile engineering to solve industry and societal problems.

CMR INSTITUTE OF TECHNOLOGY

Vision: To create world class technocrats for societal needs.

Mission: Achieve global quality technical education by assessing learning environment through

- Innovative Research & Development
- Eco-system for better Industry institute interaction
- Capacity building among stakeholders

Quality Policy: Strive for global professional excellence in pursuit of key-stakeholders.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (CSE)

Vision: Develop competent software professionals, researchers and entrepreneurs to serve global society.

Mission: The department of **Computer Science and Engineering** is committed to

- create technocrats with proficiency in design and code for software development
- adapt contemporary technologies by lifelong learning and face challenges in IT and ITES sectors
- quench the thirst of knowledge in higher education, employment, R&D and entrepreneurship

B.Tech. - Computer Science and Engineering (CSE)

I. Programme Educational Objectives (PEOs): Engineering Graduates will

1. Pursue successful professional career in IT and IT-enabled sectors.
2. Pursue lifelong learning skills to solve complex problems through multidisciplinary-research.
3. Exhibit professionalism, ethics and inter-personal skills to develop leadership qualities.

II. Programme Outcomes (POs): Engineering Graduates will be able to



1. Apply mathematics, science, engineering fundamentals to solve complex engineering problems.
2. Identify, formulate and analyze complex engineering problems to reach substantiated conclusions.
3. Design and develop a component/system/process to solve complex societal engineering problems.
4. Design and conduct experiments to analyze, interpret and synthesize data for valid conclusions.
5. Create, select and apply modern tools, skills, resources to solve complex engineering problems.
6. Apply contextual engineering knowledge to solve societal issues.
7. Adapt modern engineering practices with environmental safety and sustainable development.
8. Apply professional code of ethics, responsibilities and norms in engineering practices.
9. Compete as an individual and/or as a leader in collaborative cross cultural teams.
10. Communicate effectively through technical reports, designs, documentations and presentations.
11. Endorse cognitive management skills to prepare project report using modern tools and finance.
12. Engage in independent and life-long learning in the broad context of technological changes.

III. Programme Specific Outcomes (PSOs): Engineering Graduates will be able to

1. Design and develop Computer-Based-Systems using Algorithms, Networks, Security, Gaming, Full Stack, DevOps, IoT, Cloud, Data Science and AI&ML.
2. Apply cutting-edge technologies to solve real world problems.

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- quench the thirst of knowledge in higher education, employment, R&D and entrepreneurship

M.Tech. - Computer Science and Engineering (CSE)

I. Programme Educational Objectives (PEOs): Engineering Graduates will



1. Pursue successful professional career in diverse fields.
2. Pursue lifelong learning and research skills to solve complex engineering problems.
3. Exhibit professionalism, ethics, inter-personal skills and leadership.

II. Programme Outcomes (POs): Engineering Graduates will have ability to

1. Carry out investigation, research, development and solve complex problems independently.
2. Write, present and substantiate a technical report/document.
3. Demonstrate mastery in the field of Computer Science and Engineering.

III. Programme Specific Outcomes (PSOs): Engineering Graduates will be able to

1. Extend optimized solutions for various computing problems using cutting-edge technologies.
2. Design and develop technically-feasible and environmentally-sustainable solutions.

CMR INSTITUTE OF TECHNOLOGY

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Mission: Achieve global quality technical education by assessing learning environment through

- Innovative Research & Development
- Eco-system for better Industry institute interaction
- Capacity building among stakeholders

Quality Policy: Strive for global professional excellence in pursuit of key-stakeholders.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (DATA SCIENCE)

Vision: Develop competent software professionals, researchers and entrepreneurs to serve global society.

Mission: The department of **Computer Science and Engineering (Data Science)** is committed to

- create technocrats with proficiency in design and code for software development
- adapt contemporary technologies by lifelong learning and face challenges in IT and ITES sectors
- quench the thirst of knowledge in higher education, employment, R&D and entrepreneurship

B.Tech. - Computer Science and Engineering (Data Science)

I. Programme Educational Objectives (PEOs): Engineering Graduates will

1. Pursue successful professional career in IT and IT-enabled sectors.
2. Pursue lifelong learning skills to solve complex problems through multidisciplinary-research.
3. Exhibits professionalism, ethics and inter-personal skills to develop leadership qualities.

II. Programme Outcomes (POs): Engineering Graduates will be able to



1. Apply mathematics, science, engineering fundamentals to solve complex engineering problems.
2. Identify, formulate and analyze complex engineering problems to reach substantiated conclusions.
3. Design and develop a component/system/process to solve complex societal engineering problems.
4. Design and conduct experiments to analyze, interpret and synthesize data for valid conclusions.
5. Create, select and apply modern tools, skills, resources to solve complex engineering problems.
6. Apply contextual engineering knowledge to solve societal issues.
7. Adapt modern engineering practices with environmental safety and sustainable development.
8. Apply professional code of ethics, responsibilities and norms in engineering practices.
9. Compete as an individual and/or as a leader in collaborative cross cultural teams.
10. Communicate effectively through technical reports, designs, documentations and presentations.
11. Endorse cognitive management skills to prepare project report using modern tools and finance.
12. Engage in independent and life-long learning in the broad context of technological changes.

III. Programme Specific Outcomes (PSOs): Engineering Graduates will be able to

1. Design and develop Computer-Based-Systems using Algorithms, Networks, Security, Gaming, Full Stack, DevOps, IoT, Cloud, Data Science and AI&ML.
2. Apply data analytics to solve real world problems.

CMR INSTITUTE OF TECHNOLOGY

Vision: To create world class technocrats for societal needs.

Mission: Achieve global quality technical education by assessing learning environment through

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- Eco-system for better Industry institute interaction
- Capacity building among stakeholders

Quality Policy: Strive for global professional excellence in pursuit of key-stakeholders.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI&ML)

Vision: Develop competent software professionals, researchers and entrepreneurs to serve global society.

Mission: The department of **Computer Science and Engineering (AI&ML)** is committed to

- create technocrats with proficiency in design and code for software development
- adapt contemporary technologies by lifelong learning and face challenges in IT and ITES sectors
- quench the thirst of knowledge in higher education, employment, R&D and entrepreneurship

B.Tech. - Computer Science and Engineering (AI&ML)

I. Programme Educational Objectives (PEOs): Engineering Graduates will



1. Pursue successful professional career in IT and IT-enabled sectors.
2. Pursue lifelong learning skills to solve complex problems through multidisciplinary-research.
3. Exhibits professionalism, ethics and inter-personal skills to develop leadership qualities.

II. Programme Outcomes (POs): Engineering Graduates will be able to

1. Apply mathematics, science, engineering fundamentals to solve complex engineering problems.
2. Identify, formulate and analyze complex engineering problems to reach substantiated conclusions.
3. Design and develop a component/system/process to solve complex societal engineering problems.
4. Design and conduct experiments to analyze, interpret and synthesize data for valid conclusions.
5. Create, select and apply modern tools, skills, resources to solve complex engineering problems.
6. Apply contextual engineering knowledge to solve societal issues.
7. Adapt modern engineering practices with environmental safety and sustainable development.
8. Apply professional code of ethics, responsibilities and norms in engineering practices.
9. Compete as an individual and/or as a leader in collaborative cross cultural teams.
10. Communicate effectively through technical reports, designs, documentations and presentations.
11. Endorse cognitive management skills to prepare project report using modern tools and finance.
12. Engage in independent and life-long learning in the broad context of technological changes.

III. Programme Specific Outcomes (PSOs): Engineering Graduates will be able to

1. Design and develop Computer-Based-Systems using Algorithms, Networks, Security, Gaming, Full Stack, DevOps, IoT, Cloud, Data Science and AI&ML.
2. Apply techniques of AI&ML to solve real world problems.

CMR INSTITUTE OF TECHNOLOGY

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- Eco-system for better Industry institute interaction
- Capacity building among stakeholders

Quality Policy: Strive for global professional excellence in pursuit of key-stakeholders.

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING (ECE)

Vision: To become pioneer in the field of electronics & communication engineering by providing creative and innovative solutions for societal needs.

Mission: The department of **Electronics and Communication Engineering** is committed to



- Provide excellence in education, research and extension services.
- Provide quality education and to make the students entrepreneurs and employable.
- Learn continuously the state-of-art technologies for global excellence.

B.Tech. - Electronics and Communication Engineering (ECE)

I. Programme Educational Objectives (PEOs): Engineering Graduates will

1. Acquire core competence for a successful professional career in the field of ECE.
2. Pursue higher education with a focus on multidisciplinary research activities.
3. Adapt entrepreneurship by engaging in lifelong learning with innovation and ethics.

II. Programme Outcomes (POs): Engineering Graduates will be able to

1. Apply mathematics, science, engineering fundamentals to solve complex engineering problems.
2. Identify, formulate and analyze complex engineering problems to reach substantiated conclusions.
3. Design and develop a component/system/process to solve complex societal engineering problems.
4. Design and conduct experiments to analyze, interpret and synthesize data for valid conclusions.
5. Create, select and apply modern tools, skills, resources to solve complex engineering problems.
6. Apply contextual engineering knowledge to solve societal issues.
7. Adapt modern engineering practices with environmental safety and sustainable development.
8. Apply professional code of ethics, responsibilities and norms in engineering practices.
9. Compete as an individual and/or as a leader in collaborative cross cultural teams.
10. Communicate effectively through technical reports, designs, documentations and presentations.
11. Endorse cognitive management skills to prepare project report using modern tools and finance.
12. Engage in independent and life-long learning in the broad context of technological changes.

III. Programme Specific Outcomes (PSOs): Engineering Graduates will be able to

1. Identify the complex problems and develop solutions in the areas of communication, signal processing, VLSI, embedded systems, IoT and Cloud.
2. Demonstrate proficiency in utilization of software and hardware tools along with analytical skills to arrive at appropriate solutions.

CMR INSTITUTE OF TECHNOLOGY

Vision: To create world class technocrats for societal needs.

Mission: Achieve global quality technical education by assessing learning environment through

- Innovative Research & Development
- Eco-system for better Industry institute interaction
- Capacity building among stakeholders



Quality Policy: Strive for global professional excellence in pursuit of key-stakeholders.

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING (ECE)

Vision: To become pioneer in the field of electronics & communication engineering by providing creative and innovative solutions for societal needs.

Mission: The department of **Electronics and Communication Engineering** is committed to

- Provide excellence in education, research and extension services.
- Provide quality education and to make the students entrepreneurs and employable.
- Learn continuously the state-of-art technologies for global excellence.

M.Tech. - VLSI

I. Programme Educational Objectives (PEOs): Engineering Graduates will

1. Pursue successful career in the field of VLSI design.
2. Pursue lifelong learning for research and innovative skills to solve problems in VLSI domain.
3. Exhibit professionalism, ethics, inter-personal skills and leadership.

II. Programme Outcomes (POs): Engineering Graduates will have ability to

1. Carry out investigation, research, development and solve complex problems independently.
2. Write, present and substantiate a technical report/document.
3. Demonstrate mastery in the field of VLSI.

III. Programme Specific Outcomes (PSOs): Engineering Graduates will be able to

1. Design fault tolerant VLSI circuits to optimize power and area requirements.
2. Develop technically-feasible and environmentally-sustainable VLSI systems.

CMR INSTITUTE OF TECHNOLOGY

Vision: To create world class technocrats for societal needs.

Mission: Achieve global quality technical education by assessing learning environment through

- Innovative Research & Development
- Eco-system for better Industry institute interaction
- Capacity building among stakeholders

Quality Policy: Strive for global professional excellence in pursuit of key-stakeholders.

Master of Business Administration (MBA)

Vision: To strive for excellence in management education

Mission: Achieve global quality management education through



- state of art curriculum
- lifelong learning for professional success
- ecosystem for research and extension services

I. Programme Educational Objectives (PEOs): Management Graduates will

1. Pursue successful professional management career
2. Pursue lifelong learning to solve managerial problems
3. Exhibit ethics, entrepreneurship and leadership skills

II. Programme Outcomes (POs): Management Graduates will be able to

1. Apply knowledge of management theories and practices to solve business problems.
2. Foster analytical and critical thinking abilities for data-based decision making.
3. Develop value based leadership ability.
4. Understand, analyze and communicate global, economic, legal, and ethical aspects of business.
5. Lead teams to contribute effectively and achieve organizational goals.

III. Programme Specific Outcomes (PSOs): Management Graduates will be able to

1. Apply the knowledge of marketing, finance and human resource to analyze business environment.
2. Develop critical thinking, analytical decision-making, leadership and entrepreneurial skills.



DEPARTMENT OF CIVIL ENGINEERING(R17)

ENGINEERING MATHEMATICS – I (Differential Equations & Matrix Algebra) (Common to all Branches)

I -B.Tech.-I-Sem

Subject Code: 17CE1101BS

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve system of linear equations by using matrices	3	2	1
CO3	find Eigen values and Eigen vectors	3	2	1
CO4	find the extreme values of functions of several variables and evaluation of improper integrals by using Beta and Gamma functions	3	2	1
CO5	evaluate multiple integrals and find the line, surface and volume integrals and convert them by using multiple integrals	3	2	1

PROFESSIONAL COMMUNICATION IN ENGLISH

I-B.Tech.-I-Sem.

Subject Code: 17CE1102HS

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	apply appropriate vocabulary and grammar	3	1
CO2	use effective writing skills in formal and informal situations	3	1
CO3	demonstrate reading skills to pursue research and academic activities	3	1
CO4	apply and exhibit professional and social Etiquette	3	1
CO5	employ reference and study skills for lifelong learning	3	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

I-B.Tech.-I-Sem.

Subject Code: 17CE1103ES

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws and explain single phase AC circuits	3	3	2	1
CO2	solve electrical circuits using network theorems and illustrate diode characteristic	3	3	2	1
CO3	identify special purpose devices and use diode circuits for various applications	3	3	2	1
CO4	illustrate the configurations and biasing techniques of Bi-polar junction transistor	3	3	2	1
CO5	characterize JFET	3	3	2	1



ENGINEERING GRAPHICS

I-B.Tech.-I-Sem.

Subject Code: 17CE1104ES

L T P C
2 0 3 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2

COMPUTER PROGRAMMING

I-B.Tech.-I-Sem

Subject Code: 17CE1105ES

L T P C
3 1 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

I-B.Tech.-I-Sem.

Subject Code: 17CE1106HS

L T P C
0 0 3 2

The **Language Lab** focuses on the production and practice of sounds of language and familiarises the students with the use of English in everyday situations and contexts.

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	apply the sounds of English for proper pronunciation	3	3
CO2	use the right accent and intonation in formal and informal situations	3	3
CO3	distinguish and neutralize various accents for intelligibility	3	3
CO4	develop speaking and listening skills through audio-visual experiences	3	3
CO5	demonstrate employability skills through various activities	3	3

COMPUTER PROGRAMMING IN C LAB

I-B.Tech.-I-Sem

Subject Code: 17CE1107ES

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3



CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

I-B.Tech.-I-Sem.

L T P C

Subject Code: 17CE1108ES

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws and network theorems	3
CO2	verify the V-I characteristics of various electronic devices	3
CO3	determine the efficiency of various rectifiers	3
CO4	illustrate the configurations of Bi-polar junction transistor	3
CO5	demonstrate the characteristics of FET and SCR	3

NATIONAL SERVICE SCHEME (NSS) / PHYSICAL EDUCATION / YOGA MANDATORY COURSE (NON-CREDIT)

I-B.Tech.-I-Sem.

L T P C

Subject Code: 17AC1109MC

0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO9	PO12
CO1	harness physical literacy and lifelong engagement	3	3	3	3	3
CO2	use aesthetic appreciation	2	1	2	3	3
CO3	build competence and confidence to face challenges	1	2	1	3	3
CO4	develop Sports related values and attitudes	3	3	2	2	3
CO5	follow appropriate etiquette and sports	1	1	2	3	3

ENGINEERING MATHEMATICS – II (Vector Calculus, Fourier Analysis & PDE) (Common to all Branches)

I-B.Tech.-II-Sem.

L T P C

Subject Code: 17CE1201BS

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve ODE by using Laplace transforms	3	2	1
CO2	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO3	solve the line, surface and volume integrals by using vector integration	3	2	1
CO4	find periodic functions in terms of Fourier series and non-periodic functions of Fourier transform	3	2	1
CO5	formulate Partial Differential Equation, solve Linear and non-linear Differential Equations and analyze one dimensional heat and wave equation	3	2	1



ENGINEERING PHYSICS

I-B.Tech.-II-Sem

Subject Code: 17CE1202BS

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	compare simple and damped harmonic oscillations	3	2	1
CO2	illustrate the interference and diffraction phenomena of light	3	2	1
CO3	examine the mechanism of various lasers and holography	3	2	1
CO4	demonstrate the propagation of light in optical fiber	3	2	1
CO5	analyze the properties of nanomaterials	3	2	1

ENGINEERING CHEMISTRY

I-B.Tech.-II-Sem

Subject Code: 17CE1203BS

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	identify the properties of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	make use of polymers in domestic and industrial fields	3	2	1
CO4	analyze the quality of fuels used in automobiles, industry and aerospace	3	2	1
CO5	illustrate the properties of various engineering materials	3	2	1

ENGINEERING MECHANICS

I -B.Tech.-II-Sem

Subject Code: 17CE1204ES

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	analyze the resultant of a system of forces using principles of mechanics	3	2	1
CO2	apply the conditions of static equilibrium to particles and rigid bodies	3	2	1
CO3	determine mechanical efficiency of simple lifting machines, centroid and centre of gravity of simple sections	3	2	1
CO4	compute the second moment of inertia of various laminas and bodies	3	2	1
CO5	solve the problems involving kinetics and virtual work of particles	3	2	1

DATA STRUCTURES THROUGH C

I-B.Tech.-II-Sem.

Subject Code: 17CE1205ES

L T P C

3 1 - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	classify different data structures to design efficient programs	3	3	2	2
CO2	identify appropriate sorting and searching techniques	3	2	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2

CO4	explain various concepts of non-linear data structures	3	3	2	2
CO5	choose an appropriate hashing technique for a given problem	3	3	2	2

ENGINEERING PHYSICS / ENGINEERING CHEMISTRY LAB

I -B.Tech.-II-Sem

Subject Code: 17CE1206BS

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	identify modulus of elastic materials , determine the characteristics & applications of LED and SOLAR CELL, find the energy gap of a semiconductor and analyze the wavelength of laser source	3
CO2	demonstrate the resonance of LCR circuit, determine Time Constant of RC circuit & find variation of the magnetic field and determine losses in optical fiber	3
CO3	determine the hardness, viscosity and pH of various samples	3
CO4	synthesize the drug used in pharmaceutical industry	3
CO5	estimate the strength of solutions and amount of coloured solutions	3

DATA STRUCTURES THROUGH C LAB

I-B.Tech.-II-Sem.

Subject Code: 17CE1207ES

L T P C
- - 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	implement various searching and sorting techniques	3
CO2	demonstrate basic operations of stack and queues using arrays and linked lists	3
CO3	apply stack data structure to solve various computing problems	3
CO4	demonstrate and apply different methods for traversing graphs	3
CO5	construct binary search tree	3

IT & ENGINEERING WORKSHOP

I-B.Tech.-II-Sem.

Subject Code: 17CE1208ES

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	install and make use of operating systems and MS office tools	3	3	2	2
CO2	configure fire walls and trouble shoot network connections	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2



**MICRO PROJECT
(MANDATORY NON-CREDIT COURSE)**

I-B.Tech.-II-Sem.
Subject Code: 17AC1209MC

L T P C
0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	select problem and evaluate	3
CO2	review the literature related to the problem	3
CO3	implement principles of science and Engineering	3
CO4	analyze the problem	3
CO5	present the essence of project work	3

STATISTICAL AND NUMERICAL METHODS

II-B.Tech.-I-Sem.
Subject Code: 17CE2101BS

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	differentiate among random variables involved in the probability models	3	2	1
CO2	test hypothesis for large samples	3	2	1
CO3	test hypothesis for small samples	3	2	1
CO4	solve transcendental, linear and non-linear system of equations using numerical methods	3	2	1
CO5	find the numerical solutions for first order initial value problems and integrals	3	2	1

STRENGTH OF MATERIALS - I

II-B.Tech.-I-Sem.
Subject Code: 17CE2102PC

L T P C
4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	determine the stress and strain of various materials	3	3	2	3
CO2	sketch the SFD & BMD for beams of various supports and loads	3	3	2	3
CO3	analyze flexural and shear stresses in a beam	3	3	2	3
CO4	determine the deflections in beams under various loads & support	3	3	2	3
CO5	evaluate principal stresses, strains and various theories of failure	3	3	2	3

BUILDING MATERIALS, CONSTRUCTION AND PLANNING

II-B.Tech.-I-Sem.
Subject Code: 17CE2103ES

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO12	PO13
CO1	explain physical properties of construction materials	3	3	2	3
CO2	demonstrate various building components and services	3	3	2	3



CO3	illustrate brick, stone masonry, finishing and form works	3	3	2	3
CO4	choose different types of constructions for structural components	3	3	2	3
CO5	originate building plan by using rules and bye-laws	3	3	2	3

ENGINEERING GEOLOGY

II-B.Tech.-I-Sem.

Subject Code: 17CE2104BS

L T P C

3 1 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain weathering process and mass movement	3	2	3
CO2	classify the different minerals and rocks	3	2	3
CO3	identify the geological structures of the rocks and ground water potential	3	2	2
CO4	adapt geophysical principles for site selection	3	2	3
CO5	assess natural hazards and select sites for mass structures	3	2	2

SURVEYING

II-B.Tech.-I-Sem.

Subject Code: 17CE2105PC

L T P C

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	apply the concepts of surveying to measure the distances and directions	3	3	3	3
CO2	identify different methods of leveling to draw levels and contour maps	3	3	3	3
CO3	solve problems on areas and volumes; measure angles by Theodolite	3	3	2	3
CO4	extend methods of trigonometry & tacheometry and design the simple curves	3	3	2	3
CO5	acquaint with EDM, GPS and Total Station	3	3	3	3

COMPUTER AIDED BUILDING DRAWING LAB

II-B.Tech.-I-Sem.

Subject Code: 17CE2106ES

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PO14
CO1	make use of basic Auto CAD commands for drafting	3	3	3	3
CO2	prepare the plans for single and multistoried buildings	3	3	3	3
CO3	develop sections and elevations for various buildings	3	3	3	3
CO4	draw the detailing of building components	3	3	3	3
CO5	construct the building drawing as per standards	3	3	3	3

ENGINEERING GEOLOGY LAB

II-B.Tech.-I-Sem.

Subject Code: 17CE2107BS

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO4
CO1	analyze the physical properties of minerals	3
CO2	identify the various rocks	3
CO3	examine the various rocks using microscopic study	3
CO4	interpret and draw sections for geological maps	3
CO5	locate ground water table using electrical resistivity meter	3

SURVEYING LAB –I

II-B.Tech.-I-Sem.

Subject Code: 17CE2108PC

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PO14
CO1	find the distances and directions using the concepts of surveying	3	3	3	3
CO2	compare plotted work with the actual features of the area using plane table	3	3	3	3
CO3	identify reduced levels for L.S and C.S of road profiles using dumpy or auto level	3	3	3	3
CO4	measure horizontal and vertical angles by using theodolite	3	3	3	3
CO5	determine the heights and distances using trigonometric and tacheometric surveying	3	3	3	3

GENDER SENSITIZATION LAB

MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-I-Sem.

Subject Code: 17HS2109MC

L T P C

0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

VERBAL ABILITY

MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-I-Sem.

Subject Code: 17HS2110MC

L T P C

0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	recall grammatical and basic sentence structures for communication	3	3
CO2	list out various vocabulary forms and improve verbal ability	3	3
CO3	use sentence structures without errors	3	3



CO4	apply the sentence structure for effective paraphrasing	3	3
CO5	demonstrate effective verbal skills	3	3

STRENGTH OF MATERIALS – II

II-B.Tech.-II-Sem.

Subject Code: 17CE2201PC

L T P C
4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PO13
CO1	determine torsion in springs and shafts	3	3	3
CO2	evaluate crippling load of columns using various end conditions	3	2	3
CO3	analyze direct and bending stresses of various structures	3	2	3
CO4	find the stresses and deformations in thick and thin cylinders	3	2	3
CO5	analyze unsymmetrical bending and find shear centre for various sections	3	3	3

GEOTECHNICAL ENGINEERING

II-B.Tech.-II-Sem.

Subject Code: 17CE2202PC

L T P C
4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	explain engineering properties of soil and their applications	3	3	3	3
CO2	describe permeability and seepage of soils	3	3	2	3
CO3	analyze various theories of stress distribution and compaction mechanism in soils	3	3	2	3
CO4	determine consolidation characteristics of soils	3	3	2	3
CO5	estimate the shear strength of soils under different drainage conditions	3	3	3	3

STRUCTURAL ANALYSIS – I

II-B.Tech.-II-Sem.

Subject Code: 17CE2203PC

L T P C
4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PO13
CO1	evaluate degree of indeterminacy and forces in the frames	3	2	3
CO2	apply the energy theorems for trusses and analyze three hinged arches	3	2	3
CO3	analyze the propped cantilever and fixed beam under various loads	3	2	3
CO4	analyze continuous beams by slope deflection method	3	2	3
CO5	sketch the influence line diagrams for moving loads	3	2	3

FLUID MECHANICS

II-B.Tech.-II-Sem.

Subject Code: 17CE2204PC

L T P C
3 1 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	identify properties and influences of fluids on motion	3	3	2	3



CO2	derive the stream function from a velocity field	3	3	2	3
CO3	apply the equation of motion in flow measurements	3	3	2	3
CO4	determine energy and losses of closed conduit flow	3	3	2	3
CO5	analyze boundary layer concept on fluid flow	3	3	2	3

FINANCIAL ANALYSIS, MANAGEMENT & ECONOMICS

II-B.Tech.-II-Sem.

Subject Code: 17CE2205HS

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	analyze financial performance of an enterprise using final accounts and ratio	3	2
CO2	apply principles of management in professional career	3	2
CO3	make use of principles of economics for decision making	3	2
CO4	identify business environment and laws of demand	2	3
CO5	solve problems in the areas of production, cost, price and markets	3	3

STRENGTH OF MATERIALS LAB

II-B.Tech.-II-Sem.

Subject Code: 17CE2206PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO14
CO1	analyze stress-strain relationship for given material	3	3
CO2	determine shear modulus of shaft and stiffness of spring	3	3
CO3	assess the flexural strength for given member	3	3
CO4	find the hardness and compressive strength of given material	3	3
CO5	measure the strain in material using electrical resistance strain gauge	3	3

GEO TECHNICAL ENGINEERING LAB

II-B.Tech.-II-Sem.

Subject Code: 17CE2207PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO6	PO14
CO1	determine the index properties of soils	3	3	3
CO2	analyze the grain size of soil	3	3	3
CO3	measure the water flow through soil media	3	3	3
CO4	find the strength properties of soils	3	3	3
CO5	assess the compaction characteristics of soil	3	3	3



SURVEYING LAB –II

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17CE2208PC

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PO14
CO1	calculate the area, traverse and contour using total station	3	3	3	3
CO2	determine the elevation and stakeout using total station	3	3	3	3
CO3	measure distance, gradient and height between two inaccessible points using total station	3	3	3	3
CO4	develop curve and resection for various item of work	3	3	3	3
CO5	find the position of stations using GPS	3	3	3	3

ENVIRONMENTAL SCIENCE AND TECHNOLOGY MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17HS2209MC

3 0 0 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2

ANALYTICAL SKILLS MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17BS2210MC

0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	apply operations like searching, insertion, deletion, traversing mechanism etc. on various data structures	3	3
CO2	apply measurement techniques to data collection and utilize their innovative thinking skills to project themselves for finding fresh approaches towards tribulations	3	3
CO3	use the skills for effective communication	3	3
CO4	identify different types of arguments as well as their premises and conclusions	3	3



CO5	demonstrate the mathematical reasoning, including the ability to prove simple results and/or make statistical inferences	3	3
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HYDRAULICS & HYDRAULIC MACHINERY

III -B.Tech-I Sem.

Subject Code: 17CE3101PC

L T P C

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PO13
CO1	explain the concepts of channel flows	3	3	3
CO2	develop empirical relationships of a hydraulic model and prototype	3	3	3
CO3	determine hydrodynamic forces of jets on various vanes	3	2	3
CO4	select suitable turbine for given heads	3	2	3
CO5	estimate the efficiency of centrifugal and reciprocating pumps	3	3	3

CONCRETE TECHNOLOGY

III B. Tech. - I Sem.

Subject Code: 17CE3102PC

L T P C

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO8	PO12	PO13
CO1	explain properties of cement and aggregate as per IS codes	2	3	3	3
CO2	determine the properties of fresh concrete	3	3	2	3
CO3	examine hardened concrete properties using various methods	3	3	2	3
CO4	design concrete mix as per standard codes	3	3	2	3
CO5	make use of special concretes	3	2	3	3

ENVIRONMENTAL ENGINEERING

III-B.Tech.-I-Sem.

Subject Code: 17CE3103PC

L T P C

3 1 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO7	PO12	PO13
CO1	analyze characteristics of water and water demand	3	3	2	3	3
CO2	explain various stages in water treatment systems	3	3	3	3	3
CO3	make use of various components for water supply systems	3	3	2	3	3
CO4	construct sewerage system	3	3	3	3	3
CO5	identify various waste water treatment techniques	3	3	3	3	3

DESIGN OF REINFORCED CONCRETE STRUCTURES

III-B.Tech.-I-Sem.

Subject Code: 17CE3104PC

L T P C

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO8	PO10	PO12	PO14
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CO1	explain the various design concepts of RC structures	2	3	2	3	3
CO2	design RC beams using limit state method	3	3	3	3	3
CO3	design various types of RC slabs	3	3	3	3	3
CO4	design various RC Columns based on loading conditions	3	3	3	3	3
CO5	design various RC footings and stair cases	3	3	3	3	3

DISASTER MANAGEMENT (Open Elective - I)

III-B.Tech.-I-Sem.

Subject Code: 17CE3105OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

OPERATIONS RESEARCH (Open Elective - I)

III B.Tech.-I-Sem.

Subject Code:17ME3105OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	formulate and solve linear programming problem using various methods	3	2	3
CO2	solve transportation and assignment problems	3	3	3
CO3	compute sequencing and inventory model problems	2	2	2
CO4	analyze waiting lines and game theory problems by applying standard solution methods	3	3	3
CO5	evaluate replacement and dynamic programming problems by applying various methods	2	3	3

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (Open Elective-I)

III Year B.Tech. I-Sem

Subject Code: 17EC3105OE

L T P C
3 0 0 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2



JAVA PROGRAMMING
(Open Elective-I)

III-B.Tech.-I-Sem.

L T P C

Subject Code: 17CS31050E

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	build efficient code using multithreading and exception handling	3	2	3	3	2
CO4	illustrate event handling mechanism	3	2	3	3	2
CO5	make use if applets and swing concepts	3	2	3	3	2

CONCRETE TECHNOLOGY LAB

III B. Tech. - I Sem.

L T P C

Subject Code: 17CE3106PC

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO6	PO14
CO1	assess the properties of cement	3	3	3
CO2	analyze properties of aggregates	3	3	3
CO3	examine the properties of fresh concrete	3	3	3
CO4	determine the strength of hardened concrete	3	3	3
CO5	conduct non-destructive tests on concrete elements	3	3	3

FLUID MECHANICS & HYDRAULIC MACHINERY LAB

III-B.Tech.-I-Sem.

L T P C

Subject Code: 17CE3107PC

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO14
CO1	Describe the Theoretical concepts by conducting experiments	3	3
CO2	identify the causes for the losses in the pipe system	3	3
CO3	discuss the fundamental equations used in open channel measurements	3	3
CO4	estimate the efficiency and performance of the turbine while using characteristics curves	3	3
CO5	estimate the efficiency and performance of the of various pumps and its characteristics	3	3

ENVIRONMENTAL ENGINEERING LAB

III-B.Tech.- I-Sem.

L T P C

Subject Code: 17CE3108PC

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO14
CO1	analyze various properties of water and waste water	3	3



CO2	determine optimum dosage of coagulant	3	3
CO3	identify break - point chlorination	3	3
CO4	examine the biological characteristics of water and waste water	3	3
CO5	assess the quality of water and waste water	3	3

HUMAN VALUES AND PROFESSIONAL ETHICS
MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-I-Sem.

L T P C

Subject Code: 17HS3109MC

3 0 0 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO12
CO1	apply the importance of human values for personal and societal development	3	3	3	2
CO2	develop ethics and professional attitude	2	2	3	2
CO3	explain ethical standards in a professional environment	3	3	3	2
CO4	distinguish between professional rights and employee rights	3	3	3	2
CO5	identify their role in professional spheres	3	3	3	3

SOFT SKILLS

MANDATORY COURSE (NON-CREDIT)

III-B.Tech- I Sem

L T P C

Subject Code: 17HS3110MC

0 0 2 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	identify the need for self awareness and exhibit professional attitude	3	3
CO2	interpret and improve in personal and professional communication	3	3
CO3	develop leadership skills and enhance the employability	3	3
CO4	recognize the importance of decision making and change management to improve professional attributes	3	3
CO5	apply interview techniques for overall development	3	3

WATER RESOURCES ENGINEERING

III-B.Tech.-II-Sem.

L T P C

Subject Code: 17CE3201PC

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	illustrate the process of hydrological cycle	3	2	3	3
CO2	construct various hydrographs	3	3	2	3
CO3	analyze ground water occurrence and radial flow into wells	3	3	3	3
CO4	describe the irrigation system	3	2	3	3
CO5	design irrigation canals and cross drainage works	3	3	2	3

(Signature)

STRUCTURAL ANALYSIS – II

III-B.Tech.-II-Sem.
Subject Code: 17CE3202PC

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PO13
CO1	analyze portal frame using various methods	3	3	3
CO2	analyze two hinged arches	3	3	3
CO3	analyze multi storey frames using various approximate methods	3	3	3
CO4	analyze the continuous beams and frames using matrix method	3	3	3
CO5	construct influence lines for beams and analyze trusses	3	3	3

TRANSPORTATION ENGINEERING

III-B.Tech.-II-Sem.
Subject Code: 17CE3203PC

L T P C
4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	develop the plan and alignment of highway networks	3	3	2	3
CO2	design highway geometrics	3	3	3	3
CO3	apply the traffic rules & regulations for free flow of traffic	3	3	3	3
CO4	explain various types of intersections and its limitations	3	2	2	3
CO5	select suitable materials for construction & maintenance of highways	3	3	2	3

GLOBAL WARMING & CLIMATE CHANGE (Open Elective – II)

III-B.Tech.-II-Sem.
Subject Code: 17CE3204OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO7	PO8	PO12
CO1	describe the various consequences of climate change	3	3	3	3	2
CO2	illustrate the methods of measurement of climate change	3	3	3	3	2
CO3	analyze the causes for climate change and its impacts	3	3	3	3	2
CO4	evaluate the impact of global warming and climate change	3	3	3	3	2
CO5	explain various mitigation techniques	3	3	3	3	2

FUNDAMENTALS OF ROBOTICS (Open Elective – II)

III-B.Tech-II-Sem
Code: 17ME3204OE

L T P C Subject
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2



CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate sensors for robot	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

PRINCIPLES OF COMMUNICATION SYSTEMS
(Open Elective – II)

III -B.Tech.-II-Sem
Subject Code: 17EC3204OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the fundamentals of communication systems	3	2	2	2
CO2	analyze various analog modulation and demodulation schemes	3	3	3	2
CO3	explain sampling theorem, pulse modulation and multiplexing techniques	3	3	3	2
CO4	illustrate digital modulation schemes	3	3	2	2
CO5	develop source and channel coding techniques	3	3	3	2

DATABASE MANAGEMENT SYSTEMS
(Open Elective – II)

III-B.Tech- II Sem
Subject Code: 17CS3204OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2

CONSTRUCTION TECHNOLOGY AND MANAGEMENT
(Professional Elective – I)

III-B.Tech.-II-Sem.
Subject Code: 17CE3205PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12	PO14
CO1	explain the fundamentals of CTPM	3	3	3
CO2	plan earthwork and construction facilities	3	3	3
CO3	make use of project management and control techniques	3	3	3
CO4	illustrate model BIM and safety in construction	3	3	3
CO5	originate and negotiate contracts and tenders using codes	3	3	3



BRIDGE ENGINEERING
(Professional Elective – I)

III-B.Tech.-II-Sem.
Subject Code: 17CE3206PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO7	PO12	PO13
CO1	illustrate the classification of Bridges	3	3	3	3	3	2	3
CO2	identify the types of load acting as per IRC Loading	3	3	3	3	3	2	3
CO3	analyse the Solid Slab of Bridge	3	3	3	3	3	2	3
CO4	explain the Design theory of Girder Bridge	3	3	3	3	3	2	3
CO5	formulate the Bearings	3	3	3	3	3	2	3

GEO ENVIRONMENTAL ENGINEERING
(Professional Elective – I)

III-B.Tech.-II-Sem.
Subject Code: 17CE3207PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PO13
CO1	classify various sources of contamination of sites and its characterization methods	3	3	3	3	2	3
CO2	identify the impact of waste materials on environment and its management strategies	3	3	3	3	2	3
CO3	examine the transport of contaminant in subsurface environment	3	3	3	3	2	3
CO4	interpret various remediation methods in dealing with contaminants	3	3	3	3	2	3
CO5	construct different types of landfills and its system with suitable site selection	3	3	3	3	2	3

ELEMENTS OF EARTHQUAKE ENGINEERING
(Professional Elective – I)

III-B.Tech.-II-Sem.
Subject Code: 17CE3208PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PO13
CO1	define fundamentals of Earthquake Engineering and SDOFS	3	3	3	3	2	3
CO2	explain the concept of Earth quake resistant Building	3	3	3	3	2	3
CO3	outline the Reinforced Concrete Building models	3	3	3	3	2	3
CO4	analyse behavior the Masonry Building	3	3	3	3	2	3
CO5	apply the Ductile Detailing for both structural and Non structural elements	3	3	3	3	2	3



TRANSPORTATION ENGINEERING LAB

III-B.Tech.-II-Sem.

Subject Code: 17CE3209PC

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO7	PO14
CO1	determine various properties of aggregates	3	3	3
CO2	find various properties of bitumen	3	3	3
CO3	test strength of bitumen using marshal stability apparatus	3	3	3
CO4	estimate the traffic volume count at mid blocks and junctions	3	3	3
CO5	measure the speed of vehicles and area for parking	3	3	3

SOFTWARE APPLICATION IN CONSTRUCTION MANAGEMENT LAB

III-B.Tech.-II-Sem.

Subject Code: 17CE3210ES

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	explain various concepts of software	3	3	3
CO2	creating the Projects, activities, WBS & EPS	3	3	3
CO3	summarize the activity type & relations	3	3	3
CO4	design of networks for various type of Projects	3	3	3
CO5	choosing the type of network to be adapted for the project	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS (AECS) LAB

III-B.Tech.-II-Sem.

Subject Code: 17CE3211HS

L T P C

0 0 3 2

Pre Requisites: English

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3

QUANTITATIVE APTITUDE Mandatory Course (Non-Credit)

III-B.Tech.-II-Sem.

Subject Code: 17BS3212MC

L T P C

0 0 2 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	Recall the basics of number systems and apply them accordingly	3	3
CO2	Apply the concepts of percentages, profit and loss, & Interests in real life	3	3



	situations		
CO3	demonstrate various principles related to Distance ,speed ,time and work in solving mathematical problems	3	3
CO4	distinguish between permutations and combinations ,clocks and calendars for solving problems	3	3
CO5	apply principles of geometry and mensuration to achieve qualitative results at workplace	3	3

DESIGN & DRAWING OF STEEL STRUCTURES

IV-B.Tech.-I-Sem.

Subject Code: 17CE4101PC

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO8	PO10	PO12	PO14
CO1	explain the properties of structural steel and calculate the strength of various joints	3	3	3	2	3
CO2	design the members subjected to tension and compression	3	3	3	2	3
CO3	design the members subjected to flexure	3	3	3	2	3
CO4	design various eccentric connections	3	3	3	2	3
CO5	design plate girder and roof truss elements	3	3	3	2	3

FOUNDATION ENGINEERING

IV-B.Tech.-I-Sem.

Subject Code: 17CE4102PC

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PO14
CO1	explain the various processes of soil exploration and its bearing capacity	3	3	3	2	3
CO2	determine the slope failures using various methods	3	3	3	2	3
CO3	analyze earth retaining structures using various theories	3	3	3	2	3
CO4	illustrate various types foundations	3	3	3	2	3
CO5	make use of well foundation based on site requirements	3	3	3	2	3

ESTIMATION, QUANTITY SURVEY & VALUATION

IV-B.Tech.-I-Sem.

Subject Code: 17CE4103PC

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12	PO14
CO1	find the various quantities of building items	3	2	3
CO2	estimate earthwork for roads and canals	3	2	3
CO3	analyze the cost for various civil work items	3	2	3
CO4	determine the quantity of reinforcement and classify the contracts	3	2	3
CO5	evaluate the cost of buildings using NBC	3	2	3



ENVIRONMENTAL IMPACT ASSESSMENT
(Open Elective – III)

IV-B.Tech.-I-Sem.
Subject Code: 17CE4104OE

L T P C
3 0 0 3

Pre Requisites: Environmental Science

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO10	PO12
CO1	identify the attributes to be considered for EIA	3	3	3	3
CO2	assess impact of deforestation	3	3	3	3
CO3	interpret impact prediction, significance of soil quality and mitigation	3	3	2	3
CO4	conduct environmental audit and prepare reports	3	3	2	3
CO5	illustrate environmental policies and provisions	3	3	3	3

PRINCIPLES OF ENTREPRENEURSHIP
(Open Elective – III)

IV-B.Tech. I-Sem.
Subject Code: 17ME4104OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3

PRINCIPLES OF EMBEDDED SYSTEMS
(Open Elective – III)

IV -B.Tech.-I-Sem
Subject Code: 17EC4104OE

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the basic concepts of embedded computing	3	3	2	2
CO2	illustrate the architecture of 8051 microcontroller	3	3	3	2
CO3	develop embedded programs using 8051 microcontroller	3	3	3	2
CO4	demonstrate 8051 microcontroller interface with peripherals	3	3	3	2
CO5	explain real time operating system concepts	3	3	3	3



WEB TECHNOLOGIES (Open Elective – III)

IV – B.Tech. – I - Semester
Subject Code: 17CS4104OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2

FEM FOR CIVIL ENGINEERING (Professional Elective – II)

IV-B.Tech.-I-Sem.
Subject Code: 17CE4105PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO14
CO1	explain the fundamentals of FEA	3	3	3	2	3
CO2	formulate the stiffness matrix for 1-D element	3	3	3	2	3
CO3	compute the stiffness matrix for 2-D and 3-D element	3	3	3	2	3
CO4	analyze the plate using FEA	3	3	3	2	3
CO5	explain the non-linear finite element analysis and its applications	3	3	3	2	3

AIR POLLUTION AND CONTROL (Professional Elective – II)

IV-B.Tech.-I-Sem.
Subject Code: 17CE4106PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO7	PO8	PO12	PO13
CO1	identify the major sources, classification, causes, current issues of air pollution	3	3	3	3	2	3
CO2	explain the properties of atmosphere plume behavior and metrological phenomena	3	3	3	3	2	3
CO3	design the equipment related to control of particulate caused due to air pollution	3	3	3	3	2	3
CO4	recommend control measures related to gaseous emissions	3	3	3	3	2	3
CO5	describe air quality management measures and control systems	3	3	3	3	2	3



PRESTRESSED CONCRETE
(Professional Elective – II)

IV-B.Tech.-I-Sem.
Subject Code: 17CE4107PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PO14
CO1	illustrate concepts of pre-stressed concrete	3	3	3	2	3
CO2	determine losses of pre-stressed concrete	3	3	3	2	3
CO3	analyze PSC members for flexure and shear	3	3	3	2	3
CO4	identify transmission of pre-stressing force in pre-tensioned members	3	3	3	2	3
CO5	analyze composite members and calculate the deflection	3	3	3	2	3

GROUND WATER DEVELOPMENT & MANAGEMENT
(Professional Elective – II)

IV-B.Tech.-I-Sem.
Subject Code: 17CE4108PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PO13
CO1	analyse radial flow towards wells in confined and unconfined aquifers	3	2	3
CO2	design wells and understand the construction practices	3	2	3
CO3	interpret geophysical exploration data for scientific source finding of aquifers	3	2	3
CO4	determine the process of artificial recharge for increasing groundwater potential	3	2	3
CO5	take effective measures for controlling saline water intrusion	3	2	3

COMPUTER AIDED DESIGN LAB
(By Using Staad., Pro)

IV-B.Tech.-I-Sem.
Subject Code: 17CE4109PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PO14
CO1	make use of STAAD Pro software for analysis and design	3	3	3	3
CO2	design various components of building	3	3	3	3
CO3	design the single and multi-storeyed building	3	3	3	3
CO4	design the over head tank of various shapes	3	3	3	3
CO5	analyze and design trusses and plane frames	3	3	3	3



ADVANCED CONCRETE LAB

IV B. Tech. - I Sem.
Subject Code: 17CE4110PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO6	PO14
CO1	test the suitability of super plasticizer with cement	3	3	3
CO2	assess the properties of fresh concrete	3	3	3
CO3	assess the properties of fresh concrete	3	3	3
CO4	determine the strength of hardened concrete	3	3	3
CO5	conduct non-destructive tests on concrete elements	3	3	3

FOREIGN LANGUAGE: FRENCH MANDATORY COURSE (NON-CREDIT)

IV-B.Tech.-I-Sem.
Subject Code: 17HS4112MC

L T P C
3 0 0 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	identify the basic structure of French language, spelling and pronunciation	3	3
CO2	reproduce the grammatical structure for basic communication	3	3
CO3	recognize and use the grammatical structures for general comprehension	3	3
CO4	use the grammatical and lexical notions in formal and informal situations	3	3
CO5	apply the language skills in communicating effectively at a global platform	3	3

FOREIGN LANGUAGE: GERMAN MANDATORY COURSE (NON-CREDIT)

IV-B.Tech.-I-Sem.
Subject Code: 17HS4113MC

L T P C
3 0 0 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	identify the basic structure of German language, spelling and pronunciation	3	3
CO2	reproduce the grammatical structure for self introduction	3	3
CO3	recognize and use the grammatical article structures for basic conversation	3	3
CO4	use the grammatical and verb structure for formal and informal situations	3	3
CO5	apply the language skills in communicating effectively at a global platform	3	3

REMOTE SENSING AND GIS

IV-B.Tech.-II-Sem.
Subject Code: 17CE4201PC

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO7	PO12	PO14
CO1	illustrate the principles of photogrammetry	2	3	2	3	3



CO2	make use of remote sensing process	3	3	2	3	3
CO3	utilize GIS principles in real life	3	3	2	3	3
CO4	explain the concepts of topology, OBVDM and tomography	3	3	2	3	3
CO5	develop the geospatial data model with various file formats	3	3	3	3	3

DESIGN OF HYDRAULICS STRUCTURES (Professional Elective - III)

IV-B.Tech.-II-Sem.

Subject Code: 17CE4202PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO13
CO1	selection and design of site for Dam and Reservoir	3	3	3	2	3
CO2	design of Gravity Dams with their profiles	3	3	3	2	3
CO3	design of Earth Dams and Types of spillways with design principles	3	3	3	2	3
CO4	design of Diversion head works on permeable foundation	3	3	3	2	3
CO5	design of Cross Drainage works and Canal regulation works	3	3	3	2	3

MODERN TRANSPORTATION ENGINEERING (Professional Elective - III)

IV-B.Tech.-II-Sem.

Subject Code: 17CE4203PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PO13
CO1	illustrate classification of highway system	3	3	3	2	3
CO2	outline the features of port and harbour engineering	3	3	3	2	3
CO3	make use of GIS applications in transportation engineering	3	3	3	2	3
CO4	develop an effective railway transportation system	3	3	3	2	3
CO5	adapt airport engineering techniques	3	3	3	2	3

SOIL DYNAMICS AND MACHINE FOUNDATIONS (Professional Elective - III)

IV-B.Tech.-II-Sem.

Subject Code: 17CE4204PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO5	PO6	PO12	PO13
CO1	illustrate the problems associated with single degree freedom system and resonance	3	3	3	2	3
CO2	apply the concept of pressure bulb and wave propagation theory in soil media	3	3	3	2	3
CO3	determine the dynamic properties of soil using various methods	3	3	3	2	3
CO4	analyze the foundations for machineries under different modes of vibrations	3	3	3	2	3
CO5	design the principles of foundations, base isolation methods and its	3	3	3	2	3



material properties						
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REPAIR AND REHABILITATION OF STRUCTURES (Professional Elective - III)

IV-B.Tech.-II-Sem.

Subject Code: 17CE4205PE

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO4	PO7	PO12	PO14
CO1	identify the preventive measures against damages of structures	3	3	3	3	3
CO2	assess steel-reinforcement behaviour subject to corrosion & fire	3	3	3	3	3
CO3	predict damages and distress using NDT techniques	3	3	3	3	3
CO4	use repairing and strengthening techniques for structures	3	3	3	3	3
CO5	adapt health monitoring techniques for various structures	3	3	3	3	3

ARCHITECTURAL ENGINEERING (Professional Elective - IV)

IV-B.Tech.-II-Sem.

Subject Code: 17CE4206PE

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	analyze the ancient architecture	3	3	3	3
CO2	identify the architectural characteristics on West Asia Architecture and Egypt	3	3	3	3
CO3	distinguish the spatial and stylistic qualities associated with church architecture	3	3	3	3
CO4	develop the Gothic Architecture	3	3	3	3
CO5	identify the new beginning of Architecture	3	3	3	3

WASTE MANAGEMENT (Professional Elective - IV)

IV-B.Tech.-II-Sem.

Subject Code: 17CE4207PE

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PO13
CO1	explain the sources of solid waste and its impact	3	2	3	3	3	3
CO2	describe the process of solid waste and its management	3	3	3	3	3	3
CO3	illustrate the process of handling hazardous wastes	3	3	3	3	3	3
CO4	classify various biomedical waste management systems	3	3	3	3	3	3
CO5	apply e-waste management techniques	3	3	3	3	3	3



PAVEMENT DESIGN
(Professional Elective - IV)

IV-B.Tech.-II-Sem.
Subject Code: 17CE4208PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO12	PO14
CO1	identify various factors affecting the pavement design	2	3	3	3	3
CO2	analyze the stresses in pavements	3	3	3	3	3
CO3	design the flexible and rigid pavements using various methods	3	3	3	2	3
CO4	determine the characteristics of materials for pavement design	2	2	3	3	3
CO5	design pavement for low volume roads and over lays	3	3	3	3	3

GROUND IMPROVEMENT TECHNIQUES
(Professional Elective - IV)

IV-B.Tech.-II-Sem.
Subject Code: 17CE4209PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PO13
CO1	explain various methods of dewatering	2	3	3
CO2	identify suitable densification methods for various soils	3	3	3
CO3	improve the soil strength using grouting and stabilization methods	3	2	3
CO4	propose suitable techniques to strengthen the expansive soil	2	3	3
CO5	classify geo-synthetics and their field applications	3	3	3

DEPARTMENT OF CIVIL ENGINEERING(R18)

ENGINEERING MATHEMATICS – I (Linear Algebra and Calculus)

I-B.Tech-I-Sem.

Subject Code BSC-101

L T P C

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	analyze the nature of sequences and series	3	2	1
CO4	verify mean value theorems and evaluate improper integrals by using Beta and Gamma functions	3	2	1
CO5	find the extreme values of functions of two variables	3	2	1

ENGINEERING CHEMISTRY

I-B.Tech.-I-Sem.

Subject Code: BSC-107

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1
CO4	illustrate the various fuels, synthesis of polymers and drugs	3	2	1
CO5	analyze the properties of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

I- B.Tech. I-Sem.

Subject Code: ESC-101

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	explain the concepts of single phase and three phase AC circuits	3	3	2	1
CO3	elaborate the working principles and construction of AC and DC machines	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1

ENGINEERING MECHANICS

I- B.Tech.- I-Sem.

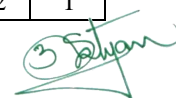
Course Code: ESC-107

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	analyze the resultant of a system of forces using principles of mechanics	3	2	1
CO2	apply the conditions of static equilibrium to particles and rigid bodies	3	2	1



CO3	determine mechanical efficiency of simple lifting machines, centroid and centre of gravity of simple sections	3	2	1
CO4	compute the second moment of inertia of various laminas and bodies	3	2	1
CO5	solve the problems involving kinetics and virtual work of particles	3	2	1

ENGINEERING CHEMISTRY LAB

I-B.Tech.-I-Sem.

Subject Code: BSC-108

L T P C
- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	determine the hardness in water samples to solve societal problems	3
CO2	estimate the strength of the given solutions	3
CO3	analyze adsorption and viscosity of various fluids	3
CO4	synthesize the various organic compounds used in medical industry	3
CO5	verify and understand the distribution coefficient	3

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB

I -B.Tech.- I-Sem.

Subject Code: ESC-102

L T P C
- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws and network theorems	3
CO2	find the efficiency of AC and DC machines	3
CO3	verify the V-I characteristics of various electronic devices	3
CO4	determine the efficiency of various rectifiers	3
CO5	illustrate the configurations of Bi-polar junction transistor	3

ENGINEERING MECHANICS LAB

I -B.Tech.- I-Sem.

Subject Code: ESC-108

L T P C
- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3
CO1	determine the resultant of a given system of forces	3
CO2	determine the moment of inertia of a body and support reactions of a given beam	3
CO3	apply the principle of moments to calculate unknown forces	3
CO4	compare frictional forces between two surfaces	3
CO5	estimate the mechanical advantage and velocity ratio for simple machines	3



IT & ENGINEERING WORKSHOP

I-B.Tech.-I-Sem.

Subject Code: ESC-110

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	install and make use of operating systems and MS office tools	3	3	2	2
CO2	configure fire walls and trouble shoot network connections	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2

TECHNOLOGY EXPLORATION FOR SOCIAL INNOVATION LAB - I MANDATORY COURSE (NON-CREDIT)

I-B.Tech.-I-Sem.

Subject Code: MC-101

L T P C

- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	identify the problems	3
CO2	illustrate social innovation	3
CO3	choose suitable processes	3
CO4	design suitable prototype	3
CO5	develop feasibility report	3

ENGINEERING MATHEMATICS – II (Advanced Calculus)

I-B.Tech.-II-Sem.

Subject Code: BSC-102

L T P C

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve linear and non-linear partial differential equations	3	2	1
CO3	evaluate the line, surface and volume integrals and convert them from one to another by using multiple integrals	3	2	1
CO4	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1



ENGINEERING PHYSICS

I-B.Tech. - II –Sem.
Subject Code: BSC-105

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	compare simple and damped harmonic oscillations	3	2	1
CO2	illustrate the interference and diffraction phenomena of light	3	2	1
CO3	examine the mechanism of various lasers and holography	3	2	1
CO4	demonstrate the propagation of light in optical fiber	3	2	1
CO5	analyze the properties of nanomaterials	3	2	1

ENGLISH

I-B.Tech.-II-Sem.
Subject Code: HSMC-101

L T P C
2 - - 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in RAWLS skills	3	1
CO2	demonstrate the acquired language in written and spoken contexts	3	1
CO3	express, restate and respond appropriately by comprehending the given data	3	1
CO4	develop proficiency to succeed in academic activities, research and career	3	1
CO5	excel in professional and social etiquette	3	1

PROGRAMMING FOR PROBLEM SOLVING

I-B.Tech.- II- Sem.
Subject Code: ESC-103

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

ENGINEERING GRAPHICS

I-B.Tech-II-Sem.
Subject Code: ESC-109

L T P C
1 - 4 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2



CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2
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ENGINEERING PHYSICS LAB

I -B.Tech.-II-Sem.

Subject Code: BSC-106

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	evaluate the physical constants and frequency by using simple harmonic vibrations	3
CO2	compare practical results with theoretical calculations in electromagnetic theory and electrical circuits	3
CO3	demonstrate the properties of lasers and optical fibers	3
CO4	find the energy gap of a semiconductor and identify its band structure	3
CO5	demonstrate the interference and dispersion phenomena of light	3

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

I-B.Tech-II-Sem.

Subject Code: HSMC-102

L T P C

- - 2 1

The **Language Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	identify the nuances of the language through multimedia experience	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3
CO4	develop speaking and listening skills	3	3
CO5	appraise communication and correspond effectively	3	3

PROGRAMMING FOR PROBLEM SOLVING LAB

I-B.Tech-II-Sem.

Subject Code: ESC-104

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3
CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3



**TECHNOLOGY EXPLORATION FOR SOCIAL INNOVATION LAB - II
MANDATORY COURSE (NON-CREDIT)**

I-B.Tech.-II-Sem.

L T P C

Subject Code: MC-102

- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	deploy suitable mechanisms	3
CO2	develop platform based innovations	3
CO3	demonstrate data acquisition and analytical skills	3
CO4	execute projects using suitable management techniques	3
CO5	adapt ethics and code of conduct	3

ENGINEERING GEOLOGY

II-B.Tech.-I-Sem.

L T P C

Subject Code: ESC-201

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain weathering process and mass movement	3	2	3
CO2	classify the different minerals and rocks	3	2	3
CO3	identify the geological structures of the rocks and ground water potential	3	2	2
CO4	adapt geophysical principles for site selection	3	2	3
CO5	assess natural hazards and select sites for mass structures	3	2	2

BUILDING MATERIALS, CONSTRUCTION AND PLANNING

II-B.Tech.-I-Sem.

L T P C

Subject Code: ESC-202

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO12	PO13
CO1	explain physical properties of construction materials	3	3	2	3
CO2	demonstrate various building components and services	3	3	2	3
CO3	illustrate brick, stone masonry, finishing and form works	3	3	2	3
CO4	choose different types of constructions for structural components	3	3	2	3
CO5	originate building plan by using rules and bye-laws	3	3	2	3

STRENGTH OF MATERIALS - I

II-B.Tech.-I-Sem.

L T P C

Subject Code: CE-PCC-211

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	determine the stress and strain of various materials	3	3	2	3



CO2	sketch the SFD & BMD for beams of various supports and loads	3	3	2	3
CO3	analyze flexural and shear stresses in a beam	3	3	2	3
CO4	determine the deflections in beams under various loads & support	3	3	2	3
CO5	evaluate principal stresses, strains and various theories of failure	3	3	2	3

FLUID MECHANICS

II-B.Tech.-I-Sem.
Subject Code: CE-PCC-212

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	identify properties and influences of fluids on motion	3	3	2	3
CO2	derive the stream function from a velocity field	3	3	2	3
CO3	apply the equation of motion in flow measurements	3	3	2	3
CO4	determine energy and losses of closed conduit flow	3	3	2	3
CO5	analyze boundary layer concept on fluid flow	3	3	2	3

SURVEYING

II-B.Tech.-I-Sem.
Subject Code: CE-PCC-213

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	apply the concepts of surveying to measure the distances and directions	3	3	3	3
CO2	identify different methods of leveling to draw levels and contour maps	3	3	3	3
CO3	solve problems on areas and volumes; measure angles by Theodolite	3	3	2	3
CO4	extend methods of trigonometry & tacheometry and design the simple curves	3	3	2	3
CO5	acquaint with EDM, GPS and Total Station	3	3	3	3

ENGINEERING GEOLOGY LAB

II-B.Tech.-I-Sem.
Subject Code: ESC-203

L T P C
- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	analyze the physical properties of minerals	3
CO2	identify the various rocks	3
CO3	examine the various rocks using microscopic study	3
CO4	interpret and draw sections for geological maps	3
CO5	locate ground water table using electrical resistivity meter	3



FLUID MECHANICS LAB

II-B.Tech.-I-Sem.
Subject Code: CE-PCC-214

L T P C
- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO14
CO1	determine the coefficient of discharge for venturimeter, orifice meter and mouth piece	3	3
CO2	perform the calibration of rectangular, triangular and trapezoidal notches	3	3
CO3	assess the major and minor losses in a flow through pipes	3	3
CO4	verify the Bernoulli's equation	3	3
CO5	analyze the effect of water hammer	3	3

SURVEYING LAB – I

II-B.Tech.-I-Sem.
Subject Code: CE-PCC-215

L T P C
- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PO14
CO1	find the distances and directions using the concepts of surveying	3	3	3	3
CO2	compare plotted work with the actual features of the area using plane table	3	3	3	3
CO3	identify reduced levels for L.S and C.S of road profiles using dumpy or auto level	3	3	3	3
CO4	measure horizontal and vertical angles by using theodolite	3	3	3	3
CO5	determine the heights and distances using trigonometric and tacheometric surveying	3	3	3	3

COMPUTER AIDED CIVIL ENGINEERING DRAWING LAB

II-B.Tech.-I-Sem.
Subject Code: CE-PCC-216

L T P C
- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PO14
CO1	make use of basic Auto CAD commands for drafting	3	3	3	3
CO2	prepare the plans for single and multistoried buildings	3	3	3	3
CO3	develop sections and elevations for various buildings	3	3	3	3
CO4	draw the detailing of building components	3	3	3	3
CO5	construct the building drawing as per standards	3	3	3	3

**ENVIRONMENTAL SCIENCES
MANDATORY COURSE (NON-CREDIT)**

II-B.Tech.-I-Sem.

L T P C

Subject Code: MC-202

2 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2

NUMERICAL AND STATISTICAL METHODS

II-B.Tech.-II-Sem.

L T P C

Subject Code: BSC-201

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve transcendental, linear and non-linear system of equations using numerical methods	3	2	1
CO2	find the numerical solutions for first order initial value problems and integrals	3	2	1
CO3	differentiate among random variables involved in the probability model	3	2	1
CO4	test hypothesis for small and large samples	3	2	1
CO5	identify the correlation coefficients, strength, direction and significance level	3	2	1

STRENGTH OF MATERIALS – II

II-B.Tech.-II-Sem.

L T P C

Subject Code: CE-PCC-221

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PO13
CO1	determine torsion in springs and shafts	3	3	3
CO2	evaluate crippling load of columns using various end conditions	3	2	3
CO3	analyze direct and bending stresses of various structures	3	2	3
CO4	find the stresses and deformations in thick and thin cylinders	3	2	3
CO5	analyze unsymmetrical bending and find shear centre for various sections	3	3	3

HYDRAULICS & HYDRAULIC MACHINERY

II-B.Tech-II-Sem.

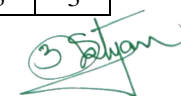
L T P C

Subject Code: CE-PCC-222

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PO13
CO1	explain the concepts of channel flows	3	3	3



CO2	develop empirical relationships of a hydraulic model and prototype	3	3	3
CO3	determine hydrodynamic forces of jets on various vanes	3	2	3
CO4	select suitable turbine for given heads	3	2	3
CO5	estimate the efficiency of centrifugal and reciprocating pumps	3	3	3

SOIL MECHANICS - I

II-B.Tech.-II-Sem.

Subject Code: CE-PCC-223

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	explain engineering properties of soil and their applications	3	2	3	3
CO2	describe permeability and seepage of soils	3	3	2	3
CO3	analyze various theories of stress distribution and compaction mechanism in soils	3	3	2	3
CO4	determine consolidation characteristics of soils	3	3	2	3
CO5	estimate the shear strength of soils under different drainage conditions	3	3	3	3

STRUCTURAL ANALYSIS

II-B.Tech.-II-Sem.

Subject Code: CE-PCC-224

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PO13
CO1	evaluate degree of indeterminacy and forces in the frames	3	2	3
CO2	apply the energy theorems for trusses and analyze three hinged arches	3	2	3
CO3	analyze the propped cantilever and fixed beam under various loads	3	2	3
CO4	analyze continuous beams by slope deflection method	3	2	3
CO5	sketch the influence line diagrams for moving loads	3	2	3

STRENGTH OF MATERIALS LAB

II-B.Tech.-II-Sem.

Subject Code: CE-PCC-225

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO14
CO1	analyze stress-strain relationship for given material	3	3
CO2	determine shear modulus of shaft and stiffness of spring	3	3
CO3	assess the flexural strength for given member	3	3
CO4	find the hardness and compressive strength of given material	3	3
CO5	measure the strain in material using electrical resistance strain gauge	3	3



HYDRAULICS & HYDRAULIC MACHINERY LAB

II B.Tech.-II-Sem.

Course Code: CE-PCC-226

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO14
CO1	calculate impact of force of Jet on different types of Vanes	3	3
CO2	analyze the performance of various turbines	3	3
CO3	determine the performance of various pumps	3	3
CO4	find energy loss in hydraulic jump and study of open channel flow	3	3
CO5	evaluate the coefficient of discharge for a weir	3	3

SURVEYING LAB –II

II-B.Tech.-II-Sem.

Subject Code: CE-PCC-227

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PO14
CO1	calculate the area, traverse and contour using total station	3	3	3	3
CO2	determine the elevation and stakeout using total station	3	3	3	3
CO3	measure distance, gradient and height between two inaccessible points using total station	3	3	3	3
CO4	develop curve and resection for various item of work	3	3	3	3
CO5	find the position of stations using GPS	3	3	3	3

COMPUTATIONAL MATHEMATICS LAB USING Sci LAB

II-B.Tech.-II-Sem.

Subject Code: BSC-203

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO14
CO1	solve problems on Linear Algebra and plotting of Graphs	3	3	3	3
CO2	find roots of an equation using various Methods	3	3	3	3
CO3	fit a curve for straight line, parabola, exponential and power curves	3	3	3	3
CO4	solve ordinary differential equations using Numerical techniques	3	3	3	3
CO5	solve ordinary integral equations using Numerical techniques	3	3	3	3

GENDER SENSITIZATION LAB (MANDATORY COURSE- NON- CREDIT)

II-B.Tech.-II-Sem.

Subject Code: MC-201

L T P C

- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

CONCRETE TECHNOLOGY

III-B.Tech.-I-Sem.

Subject Code: CE-PCC-311

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO8	PO12	PO13
CO1	explain properties of cement and aggregate as per IS codes	2	3	3	3
CO2	determine the properties of fresh concrete	3	3	2	3
CO3	examine hardened concrete properties using various methods	3	3	2	3
CO4	design concrete mix as per standard codes	3	3	2	3
CO5	make use of special concretes	3	2	3	3

SOIL MECHANICS – II

III-B.Tech.-I-Sem.

Subject Code: CE-PCC-312

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PO14
CO1	explain the various processes of soil exploration and its bearing capacity	3	3	2	3	3
CO2	determine the slope failures using various methods	3	3	3	2	3
CO3	analyze earth retaining structures using various theories	3	3	3	2	3
CO4	illustrate various types foundations	3	3	3	2	3
CO5	make use of well foundation based on site requirements	3	3	3	3	3

ENVIRONMENTAL ENGINEERING

III-B.Tech.-II-Sem.

Subject Code: CE-PCC-313

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO7	PO12	PO13
CO1	analyze characteristics of water and water demand	3	3	2	3	3
CO2	explain various stages in water treatment systems	3	3	3	3	3
CO3	make use of various components for water supply systems	3	3	2	3	3
CO4	construct sewerage system	3	3	3	3	3
CO5	identify various waste water treatment techniques	3	3	3	3	3



DESIGN OF REINFORCED CONCRETE STRUCTURES

III-B.Tech.-I-Sem.

Subject Code: CE-PCC-314

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO8	PO10	PO12	PO14
CO1	explain the various design concepts of RC structures	2	3	2	3	3
CO2	design RC beams using limit state method	3	3	3	3	3
CO3	design various types of RC slabs	3	3	3	3	3
CO4	design various RC Columns based on loading conditions	3	3	3	3	3
CO5	design various RC footings and stair cases	3	3	3	3	3

WATER RESOURCES ENGINEERING

III-B.Tech.-I-Sem.

Subject Code: CE-PCC-315

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	illustrate the process of hydrological cycle	3	2	3	3
CO2	construct various hydrographs	3	3	2	3
CO3	analyze ground water occurrence and radial flow into wells	3	3	3	3
CO4	describe the irrigation system	3	2	3	3
CO5	design irrigation canals and cross drainage works	3	3	2	3

CONCRETE TECHNOLOGY LAB

III-B.Tech.-I-Sem.

Subject Code: CE-PCC-316

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO6	PO14
CO1	assess the properties of cement	3	3	3
CO2	analyze properties of aggregates	3	3	3
CO3	examine the properties of fresh concrete	3	3	3
CO4	determine the strength of hardened concrete	3	3	3
CO5	conduct non-destructive tests on concrete elements	3	3	3

SOIL MECHANICS LAB

III-B.Tech.-I-Sem.

Subject Code: CE-PCC-317

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO6	PO14
CO1	determine the index properties of soils	3	3	3
CO2	analyze the grain size of soil	3	3	3
CO3	measure the water flow through soil media	3	3	3
CO4	find the strength properties of soils	3	3	3



CO5	assess the compaction characteristics of soil	3	3	3
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ENVIRONMENTAL ENGINEERING LAB

III-B.Tech.-I-Sem.

L T P C

Subject Code: CE-PCC-318

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO14
CO1	analyze various properties of water and waste water	3	3
CO2	determine optimum dosage of coagulant	3	3
CO3	identify break - point chlorination	3	3
CO4	examine the biological characteristics of water and waste water	3	3
CO5	assess the quality of water and waste water	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

III-B.Tech.-I-Sem.

L T P C

Subject Code: HSMC-301

1 - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3

EMPLOYABILITY SKILLS – I MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-I-Sem.

L T P C

Subject Code: MC-311

3 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3
CO3	build proficiency in quantitative reasoning	3	3
CO4	improve critical thinking skills	3	3
CO5	exhibit confidence in facing the interview process	3	3



**SUMMER INTERNSHIP - I
MANDATORY COURSE (NON-CREDIT)**

III-B.Tech.-I-Sem.

L T P C

Subject Code: MC-312

- - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

ARTIFICIAL INTELLIGENCE AND ROBOTICS

III-B.Tech.-II-Sem.

L T P C

Subject Code: CE-PCC-321

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	explain the concepts of artificial intelligence	3	3	3	3
CO2	illustrate various heuristic search techniques	3	3	3	3
CO3	relate AI techniques in industrial robotics	3	3	3	3
CO4	analyze the robot motion through direct kinematics	3	3	3	3
CO5	develop program to control industrial robots	3	3	3	3

TRANSPORTATION ENGINEERING

III-B.Tech.-II-Sem.

L T P C

Subject Code: CE-PCC-322

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	develop the plan and alignment of highway networks	3	3	2	3
CO2	design highway geometrics	3	3	3	3
CO3	apply the traffic rules & regulations for free flow of traffic	3	3	3	3
CO4	explain various types of intersections and its limitations	3	2	2	3
CO5	select suitable materials for construction & maintenance of highways	3	3	2	3

DESIGN OF STEEL STRUCTURES

III-B.Tech.-II-Sem.

L T P C

Subject Code: CE-PCC-323

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO8	PO10	PO12	PO14
CO1	explain the properties of steel and design various connections	3	3	3	3	3



CO2	design the members subjected to tension and compression	3	3	3	3	3
CO3	design the members subjected to flexure	3	3	3	3	3
CO4	design various eccentric connections	3	3	3	3	3
CO5	design plate girder and roof truss elements	3	3	3	3	3

ROCK MECHANICS
(Professional Elective – I)

III-B.Tech.-II-Sem.

Subject Code: CE-PEC-301

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO12	PO13
CO1	illustrate properties of different rocks	3	3	3	3
CO2	explain testing methods of rocks strength	3	3	3	3
CO3	determine the stress-strain relationship in rocks	3	3	3	3
CO4	estimate the stability of rock slopes, foundations and remedial measures	3	3	3	3
CO5	identify different types of excavation and controlled blasting techniques	3	3	3	3

CONSTRUCTION TECHNOLOGY & PROJECT MANAGEMENT
(Professional Elective – I)

III-B.Tech.-II-Sem.

Subject Code: CE-PEC-302

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12	PO14
CO1	explain the fundamentals of CTPM	3	3	3
CO2	plan earthwork and construction facilities	3	3	3
CO3	make use of project management and control techniques	3	3	3
CO4	illustrate model BIM and safety in construction	3	3	3
CO5	originate and negotiate contracts and tenders using codes	3	3	3

URBAN PUBLIC TRANSPORTATION SYSTEM
(Professional Elective - I)

III-B.Tech.-II-Sem.

Subject Code: CE-PEC-303

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO12	PO13
CO1	explain various modes of UPTS	3	3	3	3
CO2	analyze and plan for UPTS	3	3	3	3
CO3	plan flexible transit system	3	3	3	3
CO4	evaluate transit system	3	3	3	3
CO5	develop prototype for city traffic	3	3	3	3



IRRIGATION ENGINEERING
(Professional Elective - I)

III-B.Tech.-II-Sem.
Subject Code: CE-PEC-304

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO7	PO12	PO13
CO1	explain site selection for dams and reservoirs	2	3	3	3	3
CO2	analyze gravity dams and its stability	3	3	3	3	3
CO3	design earth dams and spillways	3	3	3	3	3
CO4	outline diversion head works	2	2	2	3	3
CO5	construct cross drainage works using design principles	3	3	3	3	3

DISASTER MANAGEMENT
(Open Elective - I)

III-B.Tech.-II-Sem.
Subject Code: OEC-301

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

FUNDAMENTALS OF OPERATIONS RESEARCH
(Open Elective-I)

III-B.Tech.-II-Sem.
Subject Code: OEC-302

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	formulate and solve linear programming problem using various methods	3	2	3
CO2	solve transportation and assignment problems	3	3	3
CO3	compute sequencing and inventory model problems	2	2	3
CO4	analyze waiting lines and game theory problems	3	3	3
CO5	evaluate replacement and dynamic programming problems	2	3	3

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Open Elective-I)

III-B.Tech.-II-Sem.
Subject Code: OEC-303

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
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CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

JAVA PROGRAMMING (Open Elective-I)

III-B.Tech.-II-Sem.

Subject Code: OEC-304

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	create packages and interfaces	3	2	3	3	2
CO4	build efficient code using multithreading and exception handling	3	2	3	3	2
CO5	design real-time applications using applets	3	2	3	3	2

INDIAN CULTURE AND CONSTITUTION (Open Elective-I)

III-B.Tech.-II-Sem.

Subject Code: OEC-305

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	1
CO2	explain features of languages, religions and holy books	3	2
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	2

ARTIFICIAL INTELLIGENCE AND ROBOTICS LAB

III-B.Tech.- II-Sem.

Subject Code: CE-PCC-324

L T P C
- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	illustrate various search techniques	3	3	3
CO2	solve real-time problems using graph theory	3	3	3
CO3	estimate the accuracy and repeatability of the robot arm	3	3	3
CO4	develop programming for robot trajectory motion	3	3	3
CO5	experiment with robot arm for palletizing, pick and place	3	3	3



TRANSPORTATION ENGINEERING LAB

III-B.Tech.-II-Sem.

Subject Code: CE-PCC-325

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO7	PO14
CO1	determine various properties of aggregates	3	3	3
CO2	find various properties of bitumen	3	3	3
CO3	test strength of bitumen using marshal stability apparatus	3	3	3
CO4	estimate the traffic volume count at mid blocks and junctions	3	3	3
CO5	measure the speed of vehicles and area for parking	3	3	3

COMPUTER AIDED CIVIL ENGINEERING DESIGN LAB

III-B.Tech.-II-Sem.

Subject Code: CE-PCC-326

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PO12	PO14
CO1	make use of STAAD Pro software for analysis and design	3	3	3	3	3
CO2	design various components of building	3	3	3	3	3
CO3	design the single and multi-storeyed building	3	3	3	3	3
CO4	design the over head tank of various shapes	3	3	3	3	3
CO5	analyze and design trusses and plane frames	3	3	3	3	3

ADVANCED CONCRETE TECHNOLOGY LAB

III-B.Tech.-II-Sem.

Subject Code: CE-PCC-327

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO6	PO14
CO1	test the suitability of super plasticizer with cement	3	3	3
CO2	assess the properties of fresh concrete	3	3	3
CO3	examine the properties of self compacting concrete	3	3	3
CO4	determine the strength of hardened concrete	3	3	3
CO5	conduct non-destructive tests on concrete elements	3	3	3

EMPLOYABILITY SKILLS – II MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-II-Sem.

Subject Code: MC-321

L T P C

3 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
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CO1	make use of soft skills to become a professional team member	3	3
CO2	develop professional correspondence skills	3	3
CO3	apply knowledge of decision making, leadership, motivation	3	3
CO4	adapt principles of quantitative aptitude to achieve qualitative results	3	3
CO5	exhibit confidence in facing the interview process	3	3

ESTIMATION AND COSTING

IV-B.Tech.-I-Sem.

Subject Code: CE-PCC-411

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12	PO13
CO1	find the various quantities of building items	3	3	3
CO2	estimate earthwork for roads and canals	3	3	3
CO3	analyze the cost for various civil work items	3	3	3
CO4	determine the quantity of reinforcement and classify the contracts	3	3	3
CO5	evaluate the cost of buildings using NBC	3	3	3

GEOSYNTHETICS AND SOIL REINFORCEMENT (Professional Elective – II)

IV-B.Tech.-I-Sem.

Subject Code: CE-PEC-401

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO12	PO13
CO1	explain the functions and applications of geosynthetics	3	3	3	3
CO2	make use of soil reinforcement mechanism	3	3	3	3
CO3	apply geosynthetics for highways and landfills	3	3	3	3
CO4	find stability of walls and embankments using soil reinforcement	3	3	3	3
CO5	adapt dewatering systems using vertical drains	3	3	3	3

FINITE ELEMENT ANALYSIS (Professional Elective – II)

IV-B.Tech.-I-Sem.

Subject Code: CE-PEC-405

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO14
CO1	explain the fundamentals of FEA	3	2	3	3	3
CO2	formulate the stiffness matrix for 1-D element	3	3	3	3	3
CO3	compute the stiffness matrix for 2-D and 3-D element	3	3	2	3	3
CO4	analyze the plates using FEA	3	3	3	3	3
CO5	apply non-linear finite element analysis	3	3	2	3	3



PAVEMENT DESIGN
(Professional Elective – II)

IV-B.Tech.-I-Sem.

Subject Code: CE-PEC-409

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO12	PO14
CO1	identify various factors affecting the pavement design	2	3	3	3	3
CO2	analyze the stresses in pavements	3	3	3	3	3
CO3	design the flexible and rigid pavements using various methods	3	3	3	2	3
CO4	determine the characteristics of materials for pavement design	2	2	3	3	3
CO5	design pavement for low volume roads and over lays	3	3	3	3	3

WATERSHED MANAGEMENT
(Professional Elective – II)

IV-B.Tech.-I-Sem.

Subject Code: CE-PEC-413

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO12	PO13
CO1	illustrate concept of watershed and its sustainable development	3	3	2	3
CO2	identify causes of soil erosion	3	3	2	3
CO3	design rain water harvesting structure	3	3	3	3
CO4	propose the methods of artificial recharge for groundwater	3	3	3	3
CO5	explain measures for reclamation of saline soils	3	3	3	3

MUNCIPAL AND HAZARDOUS WASTE MANAGEMENT
(Professional Elective - III)

IV-B.Tech.-I-Sem.

Subject Code: CE-PEC-402

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PO13
CO1	explain the sources of solid waste and its impact	3	2	3	3	3	3
CO2	describe the process of solid waste and its management	3	3	3	3	3	3
CO3	illustrate the process of handling hazardous wastes	3	3	3	3	3	3
CO4	classify various biomedical waste management systems	3	3	3	3	3	3
CO5	apply e-waste management techniques	3	3	3	3	3	3

ADVANCED STRUCTURAL ANALYSIS
(Professional Elective - III)

IV-B.Tech.-I-Sem.

Subject Code: CE-PEC-406

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO12	PO13
CO1	analyze portal frame using various methods	3	3	3
CO2	analyze two hinged arches	3	3	3
CO3	analyze multi storey frames using various approximate methods	3	3	3
CO4	analyze the continuous beams and frames using matrix method	3	3	3
CO5	construct influence lines for beams and analyze trusses	3	3	3

REMOTE SENSING AND GIS
(Professional Elective – III)

IV-B.Tech.-I-Sem.

Subject Code: CE-PEC-410

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO7	PO12	PO14
CO1	illustrate the principles of photogrammetry	2	3	2	3	3
CO2	make use of remote sensing process	3	3	2	3	3
CO3	utilize GIS principles in real life	3	3	2	3	3
CO4	explain the concepts of topology, OBVDM and tomography	3	3	2	3	3
CO5	develop the geospatial data model with various file formats	3	3	3	3	3

STOCHASTIC HYDROLOGY
(Professional Elective – III)

IV-B.Tech.-I-Sem.

Subject Code: CE-PEC-414

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO7	PO12	PO13
CO1	explain the concepts of stochastic hydrology	3	3	3	2	3
CO2	apply probability concepts to hydrology	3	3	3	2	3
CO3	test hypothesis and fit regression equation	3	3	3	2	3
CO4	apply time series data for autoregressive processes	3	3	3	2	3
CO5	develop model for operational hydrology	3	3	3	3	3

GROUND IMPROVEMENT TECHNIQUES
(Professional Elective – IV)

IV-B.Tech.-I-Sem.

Subject Code: CE-PEC-403

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PO13
CO1	explain various methods of dewatering	3	3	3
CO2	identify suitable densification methods for various soils	3	3	3
CO3	improve the soil strength using grouting and stabilization methods	3	3	3
CO4	propose suitable techniques to strengthen the expansive soil	3	3	3
CO5	classify geo-synthetics and their field applications	3	3	3



PRESTRESSED CONCRETE
(Professional Elective – IV)

IV-B.Tech.-I-Sem.

Subject Code: CE-PEC-407

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PO14
CO1	illustrate concepts of pre-stressed concrete	3	3	3	3	3
CO2	determine losses of pre-stressed concrete	3	3	2	3	3
CO3	analyze PSC members for flexure and shear	3	3	3	3	3
CO4	analyze pre-stress transfer in pre and post tensioned members	3	3	3	3	3
CO5	analyze composite members and calculate the deflection	3	3	3	3	3

TRAFFIC ENGINEERING
(Professional Elective – IV)

IV-B.Tech.-II-Sem.

Subject Code: CE-PEC-411

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO5	PO6	PO12	PO14
CO1	identify traffic stream characteristics and studies	2	3	3	3	3
CO2	explain traffic capacity and level of service	2	3	3	3	3
CO3	analyze parking problems and provide traffic safety	3	3	3	3	3
CO4	design traffic signal cycle and traffic island capacity	3	3	3	3	3
CO5	classify various traffic-environment problems	2	3	3	3	3

URBAN HYDROLOGY AND HYDRAULICS
(Professional Elective – IV)

IV-B.Tech.-I-Sem.

Subject Code: CE-PEC-415

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	explain the concepts of urban hydrologic process	2	3	3	3	3
CO2	apply statistical approaches for storm water modelling	2	3	3	3	3
CO3	develop a model urban drainage system	3	3	3	3	3
CO4	asses and mitigate risks due to storm water	3	3	3	3	3
CO5	identify an effective urban drainage maintenance systems	2	3	3	3	3

ENVIRONMENTAL IMPACT ASSESSMENT
(Open Elective-II)

IV-B.Tech.-I-Sem.

Subject Code: OEC-401

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO10	PO12
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CO1	identify the attributes to be considered for EIA	3	3	3	3
CO2	assess impact of deforestation	3	3	3	3
CO3	interpret impact prediction, significance of soil quality and mitigation	3	3	2	3
CO4	conduct environmental audit and prepare reports	3	3	2	3
CO5	illustrate environmental policies and provisions	3	3	3	3

NON-CONVENTIONAL ENERGY SOURCES

(Open Elective-II)

IV-B.Tech.-I-Sem.

Subject Code: OEC-403

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO12
CO1	analyze global and national energy scenarios	3	3	3
CO2	illustrate the various solar energy systems	3	3	3
CO3	demonstrate the aspects related to wind energy power plants	3	3	3
CO4	build the power plants using bio gas	3	3	3
CO5	estimate the power generation in hydroelectric plants	3	3	3

PRINCIPLES OF COMMUNICATION SYSTEMS

(Open Elective-II)

IV-B.Tech.-I-Sem.

Subject Code: OEC-405

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the fundamentals of communication systems	3	2	2	2
CO2	analyze various analog modulation and demodulation schemes	3	3	3	2
CO3	explain sampling theorem, pulse modulation and multiplexing techniques	3	3	3	2
CO4	illustrate digital modulation schemes	3	3	2	2
CO5	develop source and channel coding techniques	3	3	3	2

DATABASE MANAGEMENT SYSTEMS

(Open Elective-II)

IV-B.Tech.-I-Sem.

Subject Code: OEC-407

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2



INTELLECTUAL PROPERTY RIGHTS

(Open Elective-II)

IV-B.Tech.-I-Sem.

Subject Code: OEC-409

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO8	PO10	PO12
CO1	outline basics of intellectual property law	3	3	2	3	3
CO2	identify the various trademarks	3	3	2	3	3
CO3	analyze patent and copy rights law	3	3	3	3	3
CO4	differentiate trade secret and unfair practice	3	3	3	3	3
CO5	summarize new developments in Intellectual Property Rights	3	3	3	3	3

TECHNICAL WRITING SKILLS LAB

IV-B.Tech.-I-Sem.

Subject Code: HSMC-402

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	make use of language for understanding discourse and make notes	3	3
CO2	demonstrate command over using library resources for academic and other pursuits	3	3
CO3	apply knowledge of English language for creative and academic purposes	3	3
CO4	adapt principles in conveying good professional ethics	3	3
CO5	exhibit thorough awareness on research-oriented activities and career development	3	3

ESTIMATION & COSTING LAB

IV-B.Tech.-I-Sem.

Subject Code: CE-PCC-413

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	find the quantities of building items using various methods	3	3	3
CO2	estimate quantity of earthwork for roads and canals	3	3	3
CO3	analyze the cost for various civil work items	3	3	3
CO4	determine the quantity of reinforcement	3	3	3
CO5	prepare the cost estimation for various structures	3	3	3

PROJECT - I

IV-B.Tech.-I-Sem.

Subject Code: CE-PRJ-413

L T P C

- - 6 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3

**SUMMER INTERNSHIP - II
MANDATORY COURSE (NON-CREDIT)**

IV-B.Tech.-I-Sem.

L T P C

Subject Code: MC-411

- - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

MANAGEMENT, ECONOMICS AND ACCOUNTANCY

IV-B.Tech.-II-Sem.

L T P C

Subject Code: HSMC-401

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	apply principles of management in professional career	3	2
CO2	make use of principles of economics for decision making	3	2
CO3	solve problems in the areas of production, cost and price	3	2
CO4	prepare balance sheet and maintain books of accounts	2	3
CO5	analyze financial performance of an enterprise	3	3

**EARTHEN DAMS AND SLOPES STABILITY
(Professional Elective – V)**

IV-B.Tech.-II-Sem.

L T P C

Subject Code: CE-PEC-404

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO5	PO12	PO13
CO1	outline the behaviour and design criteria of earthen dams	3	3	3	3
CO2	illustrate failures in dams and their control measures	3	3	3	3
CO3	analyze slope stability of earthen dams	3	3	2	3
CO4	explain various methods of slope stability	3	3	3	3
CO5	adapt suitable techniques for slope stabilization	3	3	3	3



REPAIR AND REHABILITATION OF STRUCTURES
(Professional Elective – V)

IV-B.Tech.-II-Sem.

Subject Code: CE-PEC-408

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO4	PO7	PO12	PO14
CO1	identify the preventive measures against damages of structures	3	3	3	3	3
CO2	assess steel-reinforcement behaviour subject to corrosion & fire	3	3	3	3	3
CO3	predict damages and distress using NDT techniques	3	3	3	3	3
CO4	use repairing and strengthening techniques for structures	3	3	3	3	3
CO5	adapt health monitoring techniques for various structures	3	3	3	3	3

MODERN TRANSPORTATION ENGINEERING
(Professional Elective – V)

IV-B.Tech.-II-Sem.

Subject Code: CE-PEC-412

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PO13
CO1	illustrate classification of highway system	3	3	3	2	3
CO2	outline the features of port and harbour engineering	3	3	3	2	3
CO3	make use of GIS applications in transportation engineering	3	3	3	2	3
CO4	develop an effective railway transportation system	3	3	3	2	3
CO5	adapt airport engineering techniques	3	3	3	2	3

WATER RESOURCES SYSTEMS ANALYSIS
(Professional Elective – V)

IV-B.Tech.-II-Sem.

Subject Code: CE-PEC-416

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PO13
CO1	apply optimization techniques to water resource systems	3	3	3	3	3	3
CO2	solve linear programming problems	3	3	3	3	3	3
CO3	adapt non-linear programming techniques	3	3	3	3	2	3
CO4	develop dynamic programming model	3	3	3	3	3	3
CO5	make use of concepts of water resources economics	3	3	3	3	3	3

GREEN BUILDING TECHNOLOGIES
(Open Elective-III)

IV-B.Tech.-II-Sem.

Subject Code: OEC-402

L T P C

3 - - 3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO7	PO12
CO1	explain the fundamentals of energy use and processes in building	3	2	2	2
CO2	identify indoor environmental requirement and its management	3	3	3	2
CO3	assess the impact of solar radiation on buildings	3	3	3	2
CO4	evaluate end-use energy utilization and requirements	3	3	2	2
CO5	adapt audit procedures for energy management	3	3	3	2

FUNDAMENTALS OF ROBOTICS
(Open Elective-III)

IV-B.Tech.-II-Sem.

Subject Code: OEC-404

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2
CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate mechanical and electrical hardware for robot with feedback control	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

FUNDAMENTALS OF EMBEDDED SYSTEMS
(Open Elective – III)

IV-B.Tech.-II-Sem.

Subject Code: OEC-406

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the basic concepts of embedded computing	3	3	2	2
CO2	illustrate the architecture of 8051 microcontroller	3	3	3	2
CO3	develop embedded programs using 8051 microcontroller	3	3	3	2
CO4	demonstrate 8051 microcontroller interface with peripherals	3	3	3	2
CO5	explain real time operating system concepts	3	3	3	3

WEB TECHNOLOGIES
(Open Elective – III)

IV-B.Tech.-II-Sem.

Subject Code: OEC-408

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2



PRINCIPLES OF ENTREPRENEURSHIP
(Open Elective – III)

IV-B.Tech.-II-Sem.

Subject Code: OEC-410

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3

PROJECT - II

IV-B.Tech.-II-Sem.

Subject Code: CE-PRJ-421

L T P C

- - 22 11

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3



DEPARTMENT OF CIVIL ENGINEERING (R20)

LINEAR ALGEBRA & CALCULUS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-101	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	analyze the nature of sequences and series	3	2	1
CO4	verify mean value theorems and evaluate improper integrals by using Beta and Gamma functions	3	2	1
CO5	find the extreme values of functions of two variables	3	2	1

ENGINEERING CHEMISTRY

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-105	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1
CO4	illustrate the various fuels, synthesis of polymers and drugs	3	2	1
CO5	analyze the properties of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-101	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	elaborate the concepts of network theorems & single phase AC circuits	3	3	2	1
CO3	explain three phase AC circuits and P-N Junction Diode	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1

PROBLEM SOLVING WITH C PROGRAMMING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-103	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

ENGINEERING CHEMISTRY LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-106	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	determine the hardness in water samples to solve societal problems	3
CO2	estimate the strength of the given solutions	3
CO3	analyze adsorption and viscosity of various fluids	3
CO4	synthesize the various organic compounds used in medical industry	3
CO5	verify and understand the distribution coefficient	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-102	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws	3
CO2	evaluate network theorems	3
CO3	verify the V-I characteristics of various electronic devices	3
CO4	determine the efficiency of various rectifiers	3
CO5	illustrate the configurations of Bi-polar junction transistor	3

PROBLEM SOLVING WITH C PROGRAMMING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-104	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3
CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3

IT & ENGINEERING WORKSHOP PRACTICE

Course	B.Tech.-I-Sem.	L	T	P	C
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Subject Code	20-ESC-108	-	-	3	1.5
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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	execute simple programs using Sci Lab	3	3	2	2
CO2	design programs using conditional statements and loops	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2

NATIONAL SERVICE SCHEME (NSS)/PHYSICAL EDUCATION/YOGA MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-MC-101	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO9	PO12
CO1	harness physical literacy and lifelong engagement	3	3	3	3	3
CO2	use aesthetic appreciation	2	1	2	3	3
CO3	build competence and confidence to face challenges	1	2	1	3	3
CO4	develop Sports related values and attitudes	3	3	2	2	3
CO5	follow appropriate etiquette and sports	1	1	2	3	3

ADVANCED CALCULUS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-102	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve linear and non-linear partial differential equations	3	2	1
CO3	evaluate the line, surface and volume integrals and convert them from one to another by using multiple integrals	3	2	1
CO4	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

ENGINEERING PHYSICS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-107	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	illustrate the interference and diffraction phenomena of light	3	2	1



CO2	compare various crystal systems and characterization techniques	3	2	1
CO3	examine the mechanism of various lasers and holography	3	2	1
CO4	demonstrate the propagation of light in optical fiber	3	2	1
CO5	analyze the properties of nanomaterials	3	2	1

ENGLISH FOR ENGINEERS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-HSMC-101	2	-	-	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in RAWLS skills	3	1
CO2	demonstrate the acquired language in written and spoken contexts	3	1
CO3	express, restate and respond appropriately by comprehending the given data	3	1
CO4	develop proficiency to succeed in academic activities, research and career	3	1
CO5	excel in professional and social etiquette	3	1

DATA STRUCTURES THROUGH C

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-105	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	classify different data structures to design efficient programs	3	3	2	2
CO2	identify appropriate sorting and searching techniques	3	2	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	explain various concepts of non-linear data structures	3	3	2	2
CO5	choose an appropriate hashing technique for a given problem	3	3	2	2

COMPUTER AIDED ENGINEERING GRAPHICS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-107	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2

ENGINEERING PHYSICS LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-104	-	-	3	1.5



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	demonstrate the electrical properties of a semiconductor	3
CO2	compare practical results with theoretical calculations in electrical circuits	3
CO3	demonstrate the properties of lasers and optical fibers	3
CO4	find the energy gap of a semiconductor and identify its band structure	3
CO5	examine electrical resonance in LCR circuits	3

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-HSMC-102	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	identify the nuances of the language through multimedia experience	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3
CO4	develop speaking and listening skills	3	3
CO5	appraise communication and correspond effectively	3	3

DATA STRUCTURES THROUGH C LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-106	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	implement various searching and sorting techniques	3
CO2	demonstrate basic operations of stack and queues using arrays and linked lists	3
CO3	apply stack data structure to solve various computing problems	3
CO4	demonstrate and apply different methods for traversing graphs	3
CO5	construct binary search tree	3

ENVIRONMENTAL SCIENCE MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-MC-102	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2



BUILDING MATERIALS, CONSTRUCTION & PLANNING

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-201	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO12	PSO1
CO1	explain physical properties of construction materials	3	3	2	3
CO2	demonstrate various building components and services	3	3	2	3
CO3	illustrate brick, stone masonry, finishing and form works	3	3	2	3
CO4	choose different types of constructions for structural components	3	3	2	3
CO5	originate building plan by using rules and bye-laws	3	3	2	3

ENGINEERING MECHANICS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-203	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	analyze the resultant of a system of forces using principles of mechanics	3	2	1
CO2	apply the conditions of static equilibrium to particles and rigid bodies	3	2	1
CO3	determine mechanical efficiency of simple lifting machines, centroid and centre of gravity of simple sections	3	2	1
CO4	compute the second moment of inertia of various laminas and bodies	3	2	1
CO5	solve the problems involving kinetics and virtual work of particles	3	2	1

STRENGTH OF MATERIALS - I

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CE-PC-211	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	determine the stress and strain of various materials	3	3	2	3
CO2	sketch the SFD & BMD for beams of various supports and loads	3	3	2	3
CO3	analyze flexural and shear stresses in a beam	3	3	2	3
CO4	determine the deflections in beams under various loads & support	3	3	2	3
CO5	evaluate principal stresses, strains and various theories of failure	3	3	2	3

FLUID MECHANICS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CE-PC-212	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
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CO1	identify properties and influences of fluids on motion	3	3	2	3
CO2	derive the stream function from a velocity field	3	3	2	3
CO3	apply the equation of motion in flow measurements	3	3	2	3
CO4	determine energy and losses of closed conduit flow	3	3	2	3
CO5	analyze boundary layer concept on fluid flow	3	3	2	3

SURVEYING

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CE-PC-213	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	apply the concepts of surveying to measure the distances and directions	3	3	3	3
CO2	identify different methods of leveling to draw levels and contour maps	3	3	3	3
CO3	solve problems on areas and volumes; measure angles by Theodolite	3	3	2	3
CO4	extend methods of trigonometry & tacheometry and design the simple curves	3	3	2	3
CO5	acquaint with EDM, GPS and Total Station	3	3	3	3

SURVEYING LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CE-PC-214	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PSO2
CO1	find the distances, directions and positions of stations	3	2	2	3
CO2	identify reduced levels for L.S and C.S of road profiles	3	3	2	3
CO3	measure the distance, height between two inaccessible points, horizontal and vertical angles	3	3	2	3
CO4	determine the area, traverse, elevation, contour and stakeout	3	3	2	3
CO5	develop curve and resection for various item of work	3	3	2	3

COMPUTER AIDED CIVIL ENGINEERING DRAWING LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-202	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PSO2
CO1	make use of basic Auto CAD commands for drafting	3	3	3	3
CO2	prepare the plans for single and multistoried buildings	3	3	3	3
CO3	develop sections and elevations for various buildings	3	3	3	3
CO4	draw the detailing of building components	3	3	3	3
CO5	construct the building drawing as per standards	3	3	3	3



BUSINESS COMMUNICATION SKILLS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-HSMC-201	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3
CO3	make use of soft skills to become a professional team member	3	3
CO4	apply knowledge of decision making, leadership, motivation	3	3
CO5	exhibit confidence in facing the interview process	3	3

SOCIAL INNOVATION LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-205	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	illustrate social innovation	3
CO2	identify the problems	3
CO3	choose suitable design processes	3
CO4	develop a prototype using suitable platform	3
CO5	prepare a report using project management techniques and ethics	3

GENDER SENSITIZATION LAB (MANDATORY COURSE- NON- CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-MC-201	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

NUMERICAL AND STATISTICAL METHODS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-202	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
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CO1	solve transcendental, linear and non-linear system of equations	3	2	1
CO2	find the solutions using numerical integrals and ODE	3	2	1
CO3	differentiate among random variables involved in the probability models	3	2	1
CO4	test hypothesis for small and large samples along with significance level	3	2	1
CO5	fit correlation, regression coefficients and association of attributes	3	2	1

ENGINEERING GEOLOGY

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CE-PC-221	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain weathering process and mass movement	3	2	3
CO2	classify the different minerals and rocks	3	2	3
CO3	identify the geological structures of the rocks and ground water potential	3	2	2
CO4	adapt geophysical principles for site selection	3	2	3
CO5	assess natural hazards and select sites for mass structures	3	2	2

STRENGTH OF MATERIALS – II

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CE-PC-222	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PSO1
CO1	determine torsion in springs and shafts	3	3	3
CO2	evaluate crippling load of columns using various end conditions	3	2	3
CO3	analyze direct and bending stresses of various structures	3	2	3
CO4	find the stresses and deformations in thick and thin cylinders	3	2	3
CO5	analyze unsymmetrical bending and find shear centre for various sections	3	3	3

HYDRAULICS & HYDRAULIC MACHINERY

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CE-PC-223	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PSO1
CO1	explain the concepts of channel flows	3	3	3
CO2	develop empirical relationships of a hydraulic model and prototype	3	3	3
CO3	determine hydrodynamic forces of jets on various vanes	3	2	3
CO4	select suitable turbine for given heads	3	2	3
CO5	estimate the efficiency of centrifugal and reciprocating pumps	3	3	3



STRUCTURAL ANALYSIS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CE-PC-224	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PSO1
CO1	evaluate degree of indeterminacy and forces in the frames	3	2	3
CO2	apply the energy theorems for trusses and analyze three hinged arches	3	2	3
CO3	analyze the propped cantilever and fixed beam under various loads	3	2	3
CO4	analyze continuous beams by slope deflection method	3	2	3
CO5	sketch the influence line diagrams for moving loads	3	2	3

STRENGTH OF MATERIALS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CE-PC-225	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PSO2
CO1	analyze stress-strain relationship for given material	3	3
CO2	determine shear modulus of shaft and stiffness of spring	3	3
CO3	assess the flexural strength for given member	3	3
CO4	find the hardness and compressive strength of given material	3	3
CO5	measure the strain in material using electrical resistance strain gauge	3	3

FM & HHM LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CE-PC-226	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PSO2
CO1	determine the C_d for venturimeter, various notches and orifice meters	3	3
CO2	find the major and minor losses in pipes	3	3
CO3	verify the Bernoulli's equation and study the flow in open channel	3	3
CO4	analyze the performance of pumps, various turbines and effect of water hammer	3	3
CO5	calculate impact of force of Jet on different types of Vanes	3	3

ENGINEERING GEOLOGY LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CE-PC-227	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	analyze the physical properties of minerals	3
CO2	identify the various rocks	3

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CO3	examine the various rocks using microscopic study	3
CO4	interpret and draw sections for geological maps	3
CO5	locate ground water table using electrical resistivity meter	3

APTITUDE AND CRITICAL THINKING SKILLS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-204	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	build proficiency in quantitative reasoning	3	3
CO2	improve critical thinking skills	3	3
CO3	enhance analytical skills	3	3
CO4	demonstrate quantitative aptitude concepts	3	3
CO5	adapt principles of quantitative aptitude to achieve qualitative results	3	3

INDIAN CULTURE AND CONSTITUTION MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-MC-202	3	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	3
CO2	explain features of languages, religions and holy books	3	3
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	3

CONCRETE TECHNOLOGY

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CE-PC-311	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO8	PO12	PSO1
CO1	explain properties of cement and aggregate as per IS codes	2	3	3	3
CO2	determine the properties of fresh concrete	3	3	2	3
CO3	examine hardened concrete properties using various methods	3	3	2	3
CO4	design concrete mix as per standard codes	3	3	2	3
CO5	make use of special concretes	3	2	3	3

GEO-TECHNICAL ENGINEERING

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CE-PC-312	3	-	-	3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	explain engineering properties of soil and their applications	3	3	3	3
CO2	describe permeability and seepage of soils	3	3	3	3
CO3	analyze theories of stress distribution and compaction mechanism	3	3	2	3
CO4	determine consolidation characteristics of soils	3	3	2	3
CO5	estimate the shear strength of soils under different drainage conditions	3	3	2	3

WATER RESOURCES ENGINEERING

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CE-PC-313	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	illustrate the process of hydrological cycle	3	2	3	3
CO2	construct various hydrographs	3	3	2	3
CO3	analyze ground water occurrence and radial flow into wells	3	3	3	3
CO4	describe the irrigation system	3	2	3	3
CO5	design irrigation canals and cross drainage works	3	3	2	3

TRANSPORTATION ENGINEERING

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CE-PC-314	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	develop the plan and alignment of highway networks	3	3	2	3
CO2	design highway geometrics	3	3	3	3
CO3	apply the traffic rules & regulations for free flow of traffic	3	3	3	3
CO4	explain various types of intersections and its limitations	3	2	2	3
CO5	select suitable materials for construction & maintenance of highways	3	3	2	3

CONSTRUCTION TECHNOLOGY & MANAGEMENT (Professional Elective – I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CE-PE-311	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12	PSO2
CO1	explain the fundamentals of CTPM	3	3	3
CO2	plan earthwork and construction facilities	3	3	3
CO3	make use of project management and control techniques	3	3	3
CO4	illustrate model BIM and safety in construction	3	3	3



CO5	originate and negotiate contracts and tenders using codes	3	3	3
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ADVANCED STRUCTURAL ANALYSIS (Professional Elective - I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CE-PE-312	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PSO1
CO1	analyze portal frame using various methods	3	3	3
CO2	analyze two hinged arches	3	3	3
CO3	analyze multi storey frames using various approximate methods	3	3	3
CO4	analyze the continuous beams and frames using matrix method	3	3	3
CO5	construct influence lines for beams and analyze trusses	3	3	3

MODERN TRANSPORTATION ENGINEERING (Professional Elective - I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CE-PE-313	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO5	PO12	PSO2
CO1	illustrate classification of highway system	2	2	3	3
CO2	outline the features of port and harbour engineering	2	2	3	3
CO3	make use of GIS applications in transportation engineering	3	3	3	3
CO4	develop an effective railway transportation system	3	3	3	3
CO5	adapt airport engineering techniques	3	3	3	3

CONCRETE TECHNOLOGY LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CE-PC-315	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO6	PSO2
CO1	assess the properties of cement	3	3	3
CO2	analyze properties of aggregates	3	3	3
CO3	examine the properties of fresh concrete	3	3	3
CO4	determine the strength of hardened concrete	3	3	3
CO5	conduct non-destructive tests on concrete elements	3	3	3

GEO-TECHNICAL ENGINEERING LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CE-PC-316	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO4	PO6	PSO2
CO1	determine the index properties of soils	3	3	3
CO2	analyze the grain size of soil	3	3	3
CO3	measure the water flow through soil media	3	3	3
CO4	find the strength properties of soils	3	3	3
CO5	assess the compaction characteristics of soil	3	3	3

TRANSPORTATION ENGINEERING LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CE-PC-317	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO7	PSO2
CO1	determine various properties of aggregates	3	3	3
CO2	find various properties of bitumen	3	3	3
CO3	test strength of bitumen using marshal stability apparatus	3	3	3
CO4	estimate the traffic volume count at mid blocks and junctions	3	3	3
CO5	measure the speed of vehicles and area for parking	3	3	3

WATER DISTRIBUTION ANALYSIS AND DESIGN SOFTWARE LAB (Using Water GEMS)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CE-PC-318	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PSO2
CO1	explain the Hydraulic model	3	3	3	3
CO2	make use of Water distribution network model software	3	3	3	3
CO3	develop an existing or new networks in software	3	3	3	3
CO4	analyze input data for a network using flex tables	3	3	3	3
CO5	estimate the water quality using software	3	3	3	3

SUMMER INTERNSHIP

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CE-PR-311	-	-	-	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3



CODING SKILLS MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-MC-301	1	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO12
CO1	solve real world problems using C & DS	3	3	3	3	3
CO2	solve real world problems using DBMS	3	3	3	3	3
CO3	solve real world problems using Python	3	3	3	3	3
CO4	solve real world problems using Java, HTML, JavaScript	3	3	3	3	3
CO5	solve real world problems using any one emerging technology	3	3	3	3	3

ENVIRONMENTAL ENGINEERING

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CE-PC-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO7	PO12	PSO1
CO1	analyze characteristics of water and water demand	3	3	2	3	3
CO2	explain various stages in water treatment systems	3	3	3	3	3
CO3	make use of various components for water supply systems	3	3	2	3	3
CO4	construct sewerage system	3	3	3	3	3
CO5	identify various waste water treatment techniques	3	3	3	3	3

DESIGN OF REINFORCED CONCRETE STRUCTURES

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CE-PC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO8	PO10	PO12	PSO2
CO1	explain the various design concepts of RC structures	2	3	2	3	3
CO2	design RC beams using limit state method	3	3	3	3	3
CO3	design various types of RC slabs	3	3	3	3	3
CO4	design various RC Columns based on loading conditions	3	3	3	3	3
CO5	design various RC footings and stair cases	3	3	3	3	3

ARTIFICIAL INTELLIGENCE AND ROBOTICS

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CE-PC-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
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CO1	explain the concepts of artificial intelligence	3	3	3	3
CO2	illustrate various heuristic search techniques	3	3	3	3
CO3	relate AI techniques in industrial robotics	3	3	3	3
CO4	analyze the robot motion through direct kinematics	3	3	3	3
CO5	develop program to control industrial robots	3	3	3	3

FOUNDATION ENGINEERING (Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CE-PE-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PSO2
CO1	explain the various methods of soil exploration	3	3	3	3	3
CO2	determine the slope failures using various methods	3	2	3	3	3
CO3	analyze earth retaining structures using various theories	3	3	3	3	3
CO4	illustrate various types foundations	2	2	3	3	3
CO5	make use of well foundation based on site requirements	3	3	3	3	3

PAVEMENT DESIGN (Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CE-PE-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO12	PSO2
CO1	identify various factors affecting the pavement design	2	3	3	3	3
CO2	analyze the stresses in pavements	3	3	3	3	3
CO3	design the flexible and rigid pavements using various methods	3	3	3	2	3
CO4	determine the characteristics of materials for pavement design	2	2	3	3	3
CO5	design pavement for low volume roads and over lays	3	3	3	3	3

IRRIGATION ENGINEERING (Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CE-PE-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO7	PO12	PSO1
CO1	explain site selection for dams and reservoirs	2	3	3	3	3
CO2	analyze gravity dams and its stability	3	3	3	3	3
CO3	design earth dams and spillways	3	3	3	3	3
CO4	outline diversion head works	2	2	2	3	3
CO5	construct cross drainage works using design principles	3	3	3	3	3



DISASTER MANAGEMENT (Open Elective - I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

ROBOTICS (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2
CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate sensors for robot	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

JAVA PROGRAMMING (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-324	3	-	-	3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	create packages and interfaces	3	2	3	3	2
CO4	build efficient code using multithreading and exception handling	3	2	3	3	2
CO5	design real-time applications using applets	3	2	3	3	2

ENVIRONMENTAL ENGINEERING LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CE-PC-324	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PSO2
CO1	analyze various properties of water and waste water	3	3
CO2	determine optimum dosage of coagulant	3	3
CO3	identify break - point chlorination	3	3
CO4	examine the biological characteristics of water and waste water	3	3
CO5	assess the quality of water and waste water	3	3

ARTIFICIAL INTELLIGENCE AND ROBOTICS LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CE-PC-325	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	illustrate various search techniques	3	3	3
CO2	solve real-time problems using graph theory	3	3	3
CO3	estimate the accuracy and repeatability of the robot arm	3	3	3
CO4	develop programming for robot trajectory motion	3	3	3
CO5	experiment with robot arm for palletizing, pick and place	3	3	3

COMPUTER AIDED CIVIL ENGINEERING DESIGN LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CE-PC-326	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PO12	PSO2
CO1	make use of STAAD Pro software for analysis and design	3	3	3	3	3
CO2	design various components of building	3	3	3	3	3
CO3	design the single and multi-storeyed building	3	3	3	3	3
CO4	design the over head tank of various shapes	3	3	3	3	3
CO5	analyze and design trusses and plane frames	3	3	3	3	3



ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-HSMC-301	1	-	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3

HUMAN VALUES AND PROFESSIONAL ETHICS MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-MC-302	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO12
CO1	identify values and ethics and its relation to individual excellence	3	3	3	2
CO2	outline the ten commandments and try to apply in professional career	2	2	3	2
CO3	illustrate modern percepts of ethics, CSR and Corporate Governance	3	3	3	2
CO4	analyze the purpose of professional code of ethics and whistle blowing	3	3	3	2
CO5	practice student professional/technical societies/associations activities	3	3	3	3

BUSINESS ECONOMICS

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-HSMC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	outline the concepts of business management & economics	3	2
CO2	identify demand function to predict sales using linear regression	3	2
CO3	adapt production, price, market and cost analysis functions	3	2
CO4	estimate enterprise requirements under risky economic environment	2	3
CO5	assess the operational and financial performance of an enterprise	3	3

ESTIMATION & COSTING

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CE-PC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12	PSO2
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CO1	find the various quantities of building items	3	3	3
CO2	estimate earthwork for roads and canals	3	3	3
CO3	analyze the cost for various civil work items	3	3	3
CO4	determine the quantity of reinforcement and classify the contracts	3	3	3
CO5	evaluate the cost of buildings using NBC	3	3	3

WATERSHED MANAGEMENT (Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CE-PE-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO12	PSO1
CO1	illustrate concept of watershed and its sustainable development	3	3	2	3
CO2	identify causes of soil erosion	3	3	2	3
CO3	design rain water harvesting structure	3	3	3	3
CO4	propose the methods of artificial recharge for groundwater	3	3	3	3
CO5	explain measures for reclamation of saline soils	3	3	3	3

DESIGN OF STEEL STRUCTURES (Professional Elective - III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CE-PE-413	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO8	PO10	PO12	PSO2
CO1	explain the properties of steel and design various connections	3	3	3	3	3
CO2	design the members subjected to tension and compression	3	3	3	3	3
CO3	design the members subjected to flexure	3	3	3	3	3
CO4	design various eccentric connections	3	3	3	3	3
CO5	design plate girder and roof truss elements	3	3	3	3	3

INTELLIGENCE TRANSPORT SYSTEMS (Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CE-PE-415	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO10	PO12	PSO2
CO1	explain the fundamentals of ITS	2	2	3	2	3
CO2	outline the sensor technologies and data requirements of ITS	3	3	3	2	3
CO3	identify various ITS user services	3	3	3	3	3
CO4	select appropriate ITS technology based on site conditions	3	3	3	2	3
CO5	design and implement ITS components	3	3	3	3	3



MUNICIPAL AND HAZARDOUS WASTE MANAGEMENT (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CE-PE-412	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PSO1
CO1	explain the sources of solid waste and its impact	3	2	3	3	3	3
CO2	describe the process of solid waste and its management	3	3	3	3	3	3
CO3	illustrate the process of handling hazardous wastes	3	3	3	3	3	3
CO4	classify various biomedical waste management systems	3	3	3	3	3	3
CO5	apply e-waste management techniques	3	3	3	3	3	3

FINITE ELEMENT ANALYSIS (Professional Elective – IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CE-PE-414	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PSO2
CO1	explain the fundamentals of FEA	3	2	3	3	3
CO2	formulate the stiffness matrix for 1-D element	3	3	3	3	3
CO3	compute the stiffness matrix for 2-D and 3-D element	3	3	2	3	3
CO4	analyze the plates using FEA	3	3	3	3	3
CO5	apply non-linear finite element analysis	3	3	2	3	3

REMOTE SENSING AND GIS (Professional Elective – IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CE-PE-416	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO7	PO12	PSO2
CO1	illustrate the principles of photogrammetry	2	3	2	3	3
CO2	make use of remote sensing process	3	3	2	3	3
CO3	utilize GIS principles in real life	3	3	2	3	3
CO4	explain the concepts of topology, OBVD and tomography	3	3	2	3	3
CO5	develop the geospatial data model with various file formats	3	3	3	3	3

GREEN BUILDING TECHNOLOGIES (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-411	3	-	-	3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO7	PO12
CO1	explain the fundamentals of energy use and processes in building	3	2	2	2
CO2	identify indoor environmental requirement and its management	3	3	3	2
CO3	assess the impact of solar radiation on buildings	3	3	3	2
CO4	evaluate end-use energy utilization and requirements	3	3	2	2
CO5	adapt audit procedures for energy management	3	3	3	2

DRONES

(Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-412	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO7	PO12
CO1	explain concepts of creative industries	3	3	3	3	3	3
CO2	outline the needs of creative industries	3	3	3	3	3	3
CO3	illustrate deployment and deadly abilities of drones	3	3	3	3	3	3
CO4	adapt price based data routing in dynamic IoT	3	3	3	3	3	3
CO5	make use of security in UAV/Drone communications	3	3	3	3	3	3

**5G TECHNOLOGIES
(Open Elective-II)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-413	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO7	PO12
CO1	explain basic principles of 5G communication	3	3	2	2	3	3
CO2	identify the 5G new radio, core network, mobile networks	3	3	2	2	3	3
CO3	analyze the physical architecture of 5G and its challenges	3	3	2	2	3	3
CO4	design the modulation and multiple access technique for 5G	3	3	2	2	3	3
CO5	evaluate the various channels, layers and links used in 5G	3	3	2	2	3	3

DATABASE MANAGEMENT SYSTEMS

(Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-414	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2



CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2

BIM TECHNOLOGIES LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CE-PC-412	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PSO2
CO1	test the suitability of super plasticizer with cement	3	3	3	3
CO2	assess the properties of fresh concrete	3	3	3	3
CO3	examine the properties of self compacting concrete	3	3	3	3
CO4	determine the strength of hardened concrete	3	3	3	3
CO5	conduct non-destructive tests on concrete elements	3	3	3	3

INDUSTRY ORIENTED MINI-PROJECT

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CE-PR-411	-	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3

GROUND IMPROVEMENT TECHNIQUES (Professional Elective – IV)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CE-PE-421	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PSO1
CO1	explain various methods of dewatering	3	3	3
CO2	identify suitable densification methods for various soils	3	3	3
CO3	improve the soil strength using grouting and stabilization methods	3	3	3
CO4	propose suitable techniques to strengthen the expansive soil	3	3	3
CO5	classify geo-synthetics and their field applications	3	3	3

PRESTRESSED CONCRETE (Professional Elective – V)

Course	B.Tech.-VII-Sem.	L	T	P	C
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Subject Code	20-CE-PE-423	3	-	-	3
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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PSO2
CO1	illustrate concepts of pre-stressed concrete	3	3	3	3	3
CO2	determine losses of pre-stressed concrete	3	3	2	3	3
CO3	analyze PSC members for flexure and shear	3	3	3	3	3
CO4	analyze pre-stress transfer in pre and post tensioned members	3	3	3	3	3
CO5	analyze composite members and calculate the deflection	3	3	3	3	3

**TRAFFIC ENGINEERING
(Professional Elective – V)**

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CE-PE-425	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO5	PO6	PO12	PSO2
CO1	identify traffic stream characteristics and studies	2	3	3	3	3
CO2	explain traffic capacity and level of service	2	3	3	3	3
CO3	analyze parking problems and provide traffic safety	3	3	3	3	3
CO4	design traffic signal cycle and traffic island capacity	3	3	3	3	3
CO5	classify various traffic-environment problems	2	3	3	3	3

**EARTHEN DAMS AND SLOPES STABILITY
(Professional Elective – VI)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CE-PE-422	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO7	PO8	PO12	PSO1
CO1	outline the behaviour and design criteria of earthen dams	3	3	3	3	3	3
CO2	illustrate failures in dams and their control measures	3	3	3	3	3	3
CO3	analyze slope stability of earthen dams	3	3	3	3	2	3
CO4	explain various methods of slope stability	3	3	3	3	3	3
CO5	adapt suitable techniques for slope stabilization	3	3	3	3	3	3

**REPAIR AND REHABILITATION OF STRUCTURES
(Professional Elective – VI)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CE-PE-424	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO4	PO7	PO12	PSO2
CO1	identify the preventive measures against damages of structures	3	3	3	3	3



CO2	assess steel-reinforcement behaviour subject to corrosion & fire	3	3	3	3	3
CO3	predict damages and distress using NDT techniques	3	3	3	3	3
CO4	use repairing and strengthening techniques for structures	3	3	3	3	3
CO5	adapt health monitoring techniques for various structures	3	3	3	3	3

URBAN PUBLIC TRANSPORTATION SYSTEM (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CE-PE-426	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO12	PSO1
CO1	explain various modes of UPTS	3	3	3	3
CO2	analyze and plan for UPTS	3	3	3	3
CO3	plan flexible transit system	3	3	3	3
CO4	evaluate transit system	3	3	3	3
CO5	develop prototype for city traffic	3	3	3	3

INTELLECTUAL PROPERTY RIGHTS (Open Elective-III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-421	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO8	PO12
CO1	outline basics of intellectual property law	3	3	3	3
CO2	identify the various trademarks	3	3	3	3
CO3	analyze patent and copy rights law	3	3	3	3
CO4	differentiate trade secret and unfair practice	3	2	3	2
CO5	summarize new developments in Intellectual Property Rights	3	3	3	3

PRINCIPLES OF ENTREPRENEURSHIP (Open Elective - III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-422	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3



WEB TECHNOLOGIES (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-424	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2

MAJOR PROJECT

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CE-PR-421	-	-	20	10

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3



DEPARTMENT OF MECHANICAL ENGINEERING(R17)

ENGINEERING MATHEMATICS – I

(Differential Equations & Matrix Algebra)

(Common to all Branches)

I -B.Tech.-I-Sem

L T P C

Subject Code: 17ME1101BS

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve system of linear equations by using matrices	3	2	1
CO3	find Eigen values and Eigen vectors	3	2	1
CO4	find the extreme values of functions of several variables and evaluation of improper integrals by using Beta and Gamma functions	3	2	1
CO5	evaluate multiple integrals and find the line, surface and volume integrals and convert them by using multiple integrals	3	2	1

ENGINEERING PHYSICS

I-B.Tech.-I-Sem

L T P C

Subject Code: 17ME1102BS

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	compare simple and damped harmonic oscillations	3	2	1
CO2	illustrate the interference and diffraction phenomena of light	3	2	1
CO3	examine the mechanism of various lasers and holography	3	2	1
CO4	demonstrate the propagation of light in optical fiber	3	2	1
CO5	analyze the properties of nanomaterials	3	2	1



ENGINEERING CHEMISTRY

I-B.Tech.-I-Sem

L T P C

Subject Code: 17ME1103BS

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	identify the properties of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	make use of polymers in domestic and industrial fields	3	2	1
CO4	analyze the quality of fuels used in automobiles, industry and aerospace	3	2	1
CO5	illustrate the properties of various engineering materials	3	2	1

ENGINEERING MECHANICS

I-B.Tech.-I-Sem

L T P C

Subject Code: 17ME1104ES

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	analyze the resultant of a system of forces using principles of mechanics	3	2	1
CO2	apply the conditions of static equilibrium to particles and rigid bodies	3	2	1
CO3	determine mechanical efficiency of simple lifting machines, centroid and centre of gravity of simple sections	3	2	1
CO4	compute the second moment of inertia of various laminas and bodies	3	2	1
CO5	solve the problems involving kinetics and virtual work of particles	3	2	1

COMPUTER PROGRAMMING

I-B.Tech.-I-Sem

L T P C

Subject Code: 17ME1105ES

3 1 0 3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

ENGINEERING PHYSICS / ENGINEERING CHEMISTRY LAB

I-B.Tech.-I-Sem

L T P C

Subject Code: 17ME1106BS

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	identify modulus of elastic materials , determine the characteristics & applications of LED and SOLAR CELL, find the energy gap of a semiconductor and analyze the wavelength of laser source	3
CO2	demonstrate the resonance of LCR circuit, determine Time Constant of RC circuit & find variation of the magnetic field and determine losses in optical fiber	3
CO3	determine the hardness, viscosity and pH of various samples	3
CO4	synthesize the drug used in pharmaceutical industry	3
CO5	estimate the strength of solutions and amount of coloured solutions	3

COMPUTER PROGRAMMING IN C LAB

I-B.Tech.-I-Sem

L T P C

Subject Code: 17ME1107ES

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3



CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3

IT & ENGINEERING WORKSHOP

I-B.Tech.-I-Sem.

L T P C

Subject Code: 17ME1108ES

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	install and make use of operating systems and MS office tools	3	3	2	2
CO2	configure fire walls and trouble shoot network connections	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2

NATIONAL SERVICE SCHEME (NSS) / PHYSICAL EDUCATION / YOGA

MANDATORY COURSE (NON-CREDIT)

I-B.Tech.-I-Sem.

L T P C

Subject Code: 17AC1108MC

0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO9	PO12
CO1	harness physical literacy and lifelong engagement	3	3	3	3	3
CO2	use aesthetic appreciation	2	1	2	3	3
CO3	build competence and confidence to face challenges	1	2	1	3	3

(Handwritten Signature)

CO4	develop Sports related values and attitudes	3	3	2	2	3
CO5	follow appropriate etiquette and sports	1	1	2	3	3

ENGINEERING MATHEMATICS – II

(Vector Calculus, Fourier Analysis & PDE)

(Common to all Branches)

I-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME1201BS

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve ODE by using Laplace transforms	3	2	1
CO2	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO3	solve the line, surface and volume integrals by using vector integration	3	2	1
CO4	find periodic functions in terms of Fourier series and non-periodic functions of Fourier transform	3	2	1
CO5	formulate Partial Differential Equation, solve Linear and non-linear Differential Equations and analyze one dimensional heat and wave equation	3	2	1

PROFESSIONAL COMMUNICATION IN ENGLISH

I-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME1202HS

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	apply appropriate vocabulary and grammar	3	1
CO2	use effective writing skills in formal and informal situations	3	1
CO3	demonstrate reading skills to pursue research and academic activities	3	1
CO4	apply and exhibit professional and social Etiquette	3	1



CO5	employ reference and study skills for lifelong learning	3	1
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BASIC ELECTRICAL & ELECTRONICS ENGINEERING

I-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME1203ES

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws and explain single phase AC circuits	3	3	2	1
CO2	solve electrical circuits using network theorems and illustrate diode characteristic	3	3	2	1
CO3	identify special purpose devices and use diode circuits for various applications	3	3	2	1
CO4	illustrate the configurations and biasing techniques of Bi-polar junction transistor	3	3	2	1
CO5	characterize JFET	3	3	2	1

ENGINEERING GRAPHICS

I-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME1204ES

2 0 3 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2



DATA STRUCTURES THROUGH C

I-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME1205ES

3 1 - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	classify different data structures to design efficient programs	3	3	2	2
CO2	identify appropriate sorting and searching techniques	3	2	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	explain various concepts of non-linear data structures	3	3	2	2
CO5	choose an appropriate hashing technique for a given problem	3	3	2	2

ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

I-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME1206HS

0 0 3 2

The **Language Lab** focuses on the production and practice of sounds of language and familiarises the students with the use of English in everyday situations and contexts.

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	apply the sounds of English for proper pronunciation	3	3
CO2	use the right accent and intonation in formal and informal situations	3	3
CO3	distinguish and neutralize various accents for intelligibility	3	3
CO4	develop speaking and listening skills through audio-visual experiences	3	3
CO5	demonstrate employability skills through various activities	3	3



DATA STRUCTURES THROUGH C LAB

I-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME1207ES

- - 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	implement various searching and sorting techniques	3
CO2	demonstrate basic operations of stack and queues using arrays and linked lists	3
CO3	apply stack data structure to solve various computing problems	3
CO4	demonstrate and apply different methods for traversing graphs	3
CO5	construct binary search tree	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

I-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME1208ES

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws and network theorems	3
CO2	verify the V-I characteristics of various electronic devices	3
CO3	determine the efficiency of various rectifiers	3
CO4	illustrate the configurations of Bi-polar junction transistor	3
CO5	demonstrate the characteristics of FET and SCR	3

MICRO PROJECT (MANDATORY NON-CREDIT COURSE)

I-B.Tech.-II-Sem.

L T P C

Subject Code: 17AC1209MC

0 0 2 -



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	select problem and evaluate	3
CO2	review the literature related to the problem	3
CO3	implement principles of science and Engineering	3
CO4	analyze the problem	3
CO5	present the essence of project work	3

STATISTICAL AND NUMERICAL METHODS

II-B.Tech.-I-Sem.

L T P C

Subject Code: 17ME2101BS

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	differentiate among random variables involved in the probability models	3	2	1
CO2	test hypothesis for large samples	3	2	1
CO3	test hypothesis for small samples	3	2	1
CO4	solve transcendental, linear and non-linear system of equations using numerical methods	3	2	1
CO5	find the numerical solutions for first order initial value problems and integrals	3	2	1

METALLURGY AND MATERIAL SCIENCE

II-B.Tech.-I-Sem.

L T P C

Subject Code: 17ME2102ES

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the concepts of structure of metals and constitution of alloys	3	2	1
CO2	construct and interpret equilibrium phase diagrams	3	2	1



CO3	analyze the material properties of ferrous and non-ferrous alloys	3	2	1
CO4	apply various heat treatment methods to steels	3	2	1
CO5	outline the properties, applications of ceramic and composite materials	3	2	1

MECHANICS OF SOLIDS

II-B.Tech.-I-Sem.

L T P C

Subject Code: 17ME2103PC

3 1 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO13
CO1	determine the stress and strain of various materials	3	3	2	2	3
CO2	sketch the shear force and bending moment diagrams for beams of various supports and loads	3	3	2	3	3
CO3	analyze flexural and shear stresses in a beam	3	3	3	2	3
CO4	evaluate principal stresses, strains and various theories of failure	3	3	3	3	3
CO5	determine stresses and deformations in shafts and thin cylinders	3	3	2	2	3

THERMODYNAMICS

II-B.Tech.-I-Sem.

L T P C

Subject Code: 17ME2104BS

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO14
CO1	explain various thermodynamic systems and processes	3	3	2	3
CO2	apply the basic laws of thermodynamics	3	3	2	3
CO3	evaluate the performance of energy conversion devices	3	3	2	3
CO4	find property values during process using mixture of gasses concepts	3	3	2	3
CO5	assess performance parameters of thermodynamic cycles	3	3	2	3



KINEMATICS OF MACHINERY

II-B.Tech.-I-Sem.

L T P C

Subject Code: 17ME2105PC

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	illustrate concepts of kinematics and mechanisms of machines	3	3	2	2
CO2	evaluate velocity and acceleration of simple mechanisms	3	3	3	2
CO3	explain working principle of various straight line mechanisms	3	3	2	2
CO4	develop cam profiles based on follower motion	3	3	3	2
CO5	solve problems related to gears and gear trains	3	3	3	3

METALLURGY & MATERIAL SCIENCE LAB

II-B.Tech.-I-Sem.

L T P C

Subject Code: 17ME2106ES

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5
CO1	interpret crystal structure and necessity of alloying	3	3	3
CO2	perform metallographic characterization of metals and metal alloys	3	3	3
CO3	plot the hardness variations of heat treated and non-heat treated steels	3	3	3
CO4	select materials for various engineering applications	3	3	3
CO5	apply the skills and modern techniques for latest materials	3	3	3

FUELS AND LUBRICANTS LAB

II-B.Tech.-I-Sem.

L T P C

Subject Code: 17ME2107BS

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5
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CO1	determine flash and fire point of fuels	3	3	3
CO2	experiment with bomb calorimeter	3	3	3
CO3	determine viscosity of lubricants	3	3	3
CO4	evaluate the percentage of carbon residue in fuel sample	3	3	3
CO5	predict penetration depth using grease penetration test	3	3	3

MECHANICS OF SOLIDS LAB

II-B.Tech.-I-Sem.

L T P C

Subject Code: 17ME2108PC

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO13
CO1	analyze stress-strain relationship for given material	2	3	3
CO2	assess the flexural strength for given member	2	3	3
CO3	determine shear modulus of shaft and stiffness of spring	2	3	3
CO4	find the hardness and compressive strength of given material	2	3	3
CO5	measure toughness using Charpy and Izod tests	2	3	3

ENVIRONMENTAL SCIENCE AND TECHNOLOGY

MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-I-Sem.

L T P C

Subject Code: 17HS2109MC

3 0 0 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2



CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2

**ANALYTICAL SKILLS
MANDATORY COURSE (NON-CREDIT)**

II-B.Tech.-I-Sem.

L T P C

Subject Code: 17BS2110MC

0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	apply operations like searching, insertion, deletion, traversing mechanism etc. on various data structures	3	3
CO2	apply measurement techniques to data collection and utilize their innovative thinking skills to project themselves for finding fresh approaches towards tribulations	3	3
CO3	use the skills for effective communication	3	3
CO4	identify different types of arguments as well as their premises and conclusions	3	3
CO5	demonstrate the mathematical reasoning, including the ability to prove simple results and/or make statistical inferences	3	3

MANUFACTURING PROCESS

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME2201PC

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO14
CO1	explain concepts of various casting techniques	3	3	2	3
CO2	differentiate various welded joints	3	3	2	3
CO3	distinguish the process details of soldering, brazing and welding	3	3	3	3
CO4	illustrate various techniques of metal working	3	3	2	3
CO5	distinguish various extrusion and forging techniques	3	3	3	3



DYNAMICS OF MACHINES

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME2202PC

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the concepts of Gyroscopes, static and dynamic force analysis	3	3	2	3
CO2	illustrate turning moment diagrams and design of fly wheels	3	3	2	3
CO3	outline the concepts of friction-clutches, brakes and dynamometers	3	3	2	3
CO4	analyze balancing of rotating masses and characteristics of governors	3	3	2	3
CO5	summarize free and forced vibrations	3	3	2	3

FLUID MECHANICS & HYDRAULIC MACHINERY

II-B.Tech.-I-Sem.

L T P C

Subject Code: 17ME2203PC

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the concepts of fluid statics	3	3	2	2
CO2	describe the concepts of fluid kinematics and dynamics	3	3	3	3
CO3	analyze flow through different pipes and boundary layer theory	3	3	3	3
CO4	select suitable turbine for given heads	3	3	3	2
CO5	estimate performance parameters of hydraulic machines	3	3	3	3

MACHINE DRAWING PRACTICE

II-B.Tech - II-Sem.

L T P C

Subject Code: 17ME2204PC

1 0 3 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO6	PO10	PO13	PO14
CO1	apply the principles of engineering drawing in machine drawing	3	3	3	3	3	3



CO2	make use of conventional representation of materials and machine components	3	3	3	3	3	3
CO3	illustrate various permanent and temporary Fasteners, Joints and Couplings	3	3	3	3	3	3
CO4	develop assembly drawings from the given part drawing and vice versa	3	3	3	3	3	3
CO5	construct computer aided drawings using CAD software package	3	3	3	3	3	3

FINANCIAL ANALYSIS, MANAGEMENT & ECONOMICS

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME2205HS

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	analyze financial performance of an enterprise using final accounts and ratio	3	2
CO2	apply principles of management in professional career	3	2
CO3	make use of principles of economics for decision making	3	2
CO4	identify business environment and laws of demand	2	3
CO5	solve problems in the areas of production, cost, price and markets	3	3

MANUFACTURING PROCESSES LAB

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME2206PC

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO14
CO1	perform the casting process in manufacturing of different types products	3	3	3
CO2	determine the properties of different types of moulding sands	3	3	3
CO3	illustrate different welding processes required for fabrication	3	3	3
CO4	test the various metal forming processes	3	3	3



CO5	make use of blow and injection moulding equipment	3	3	3
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KINEMATICS AND DYNAMICS LAB

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME2207PC

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO13
CO1	estimate primary & secondary forces for dynamic balancing of rotary masses	3	3	3
CO2	analyse the response of different vibrating systems	3	3	3
CO3	test the performance of governors	3	3	3
CO4	determine the effect of gyroscope for different motions	3	3	3
CO5	analyze cam profile	3	3	3

FLUID MECHANICS & HYDRAULIC MACHINERY LAB

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17ME2208PC

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO14
CO1	find co-efficient of discharge for the venturimeter and orifice meter	2	3	2
CO2	determine minor losses and friction factor for a given pipeline	2	3	2
CO3	verify Bernoulli's equation	2	3	2
CO4	calculate impact of force of Jet on different types of Vanes	2	3	2
CO5	analyze the performance of various turbines and pumps	2	3	2

GENDER SENSITIZATION LAB

MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17HS2209MC

0 0 2 -



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

VERBAL ABILITY

MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-II-Sem.

Subject Code: 17HS2210MC

L T P C

0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	recall grammatical and basic sentence structures for communication	3	3
CO2	list out various vocabulary forms and improve verbal ability	3	3
CO3	use sentence structures without errors	3	3
CO4	apply the sentence structure for effective paraphrasing	3	3
CO5	demonstrate effective verbal skills	3	3

THERMAL ENGINEERING – I

III-B.Tech-I-Sem

Subject Code: 17ME3101PC

L T P C

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO12	PO14
CO1	explain functioning of various IC engines	3	3	2	3
CO2	distinguish normal and abnormal combustion phenomena in IC Engines	3	3	2	3



CO3	express the effect of various operating variables on engine performance	3	3	2	3
CO4	demonstrate functioning of reciprocating, rotary and dynamic compressors	3	3	2	3
CO5	analyze functioning of axial flow compressors	3	3	2	3

DESIGN OF MACHINE ELEMENTS – I

B.Tech. III Year I Sem

L T P C

Subject Code: 17ME3102PC

3 1 0 3

Note: Design Data books are not permitted in the Examinations. The design must not only satisfy strength criteria but also rigidity criteria.

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PO13
CO1	explain the design procedure and select materials for specific application	3	3	2	2	3
CO2	evaluate the strength, stiffness and fatigue of machine elements	3	3	2	2	3
CO3	design riveted, welded and bolted joints	3	3	3	2	3
CO4	design keys, cotters, knuckle joints	3	3	3	2	3
CO5	design shafts and couplings	3	3	3	2	3

REFRIGERATION & AIR-CONDITIONING

III-B.Tech.-I-Sem

L T P C

Subject Code: 17ME3103PC

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PO14
CO1	apply the concepts of refrigeration to various systems	3	3	2	2	3
CO2	analyze the performance of vapor compression systems	3	3	2	2	3
CO3	illustrate the components of refrigeration system	3	3	2	2	3



CO4	outline vapor absorption, steam jet refrigeration systems	3	3	2	2	3
CO5	determine cooling and heating loads in air conditioning systems	3	3	2	2	3

MACHINE TOOLS AND METROLOGY

III-B.Tech.-I-Sem

L T P C

Subject Code: 17ME3104PC

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO14
CO1	explain cutting tool geometry, types of lathes and chip formation	3	3	3	2	3
CO2	illustrate operations of drilling, and boring machines	3	3	2	2	3
CO3	make use of the operations of milling and grinding machines	3	3	2	2	3
CO4	analyze the limits and tolerances for engineering components	3	3	3	2	3
CO5	test surface roughness of part and tool alignment	3	3	3	2	3

DISASTER MANAGEMENT

(Open Elective - I)

III-B.Tech.-I-Sem

L T P C

Subject Code: 17CE3105OE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3



OPERATIONS RESEARCH
(Open Elective - I)

III-B.Tech.-I-Sem

L T P C

Subject Code: 17ME3105OE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	formulate and solve linear programming problem using various methods	3	2	3
CO2	solve transportation and assignment problems	3	3	3
CO3	compute sequencing and inventory model problems	2	2	3
CO4	analyze waiting lines and game theory problems	3	3	3
CO5	evaluate replacement and dynamic programming problems	2	3	3

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Open Elective-I)

III Year B.Tech I-Sem

L T P C

Subject Code: 17EC3105OE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2



JAVA PROGRAMMING

(Open Elective-I)

III-B.Tech.-I-Sem

Subject Code: 17CS31050E

L T P C

3 0 0 3

Prerequisites: A basic idea of “Computer Programming & Data Structures”

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	build efficient code using multithreading and exception handling	3	2	3	3	2
CO4	illustrate event handling mechanism	3	2	3	3	2
CO5	make use if applets and swing concepts	3	2	3	3	2

THERMAL ENGINEERING LAB

III-B.Tech-I-Sem

Subject Code: 17ME3106PC

L T P C

0 0 3 2

Pre-Requisite: Thermodynamics

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO7	PO14
CO1	construct valve timing diagram and test the performance of IC engines	3	3	3	3
CO2	find engine frictional power by motoring, retardation and Morse tests	3	3	3	3
CO3	determine volumetric efficiency of IC engines	3	3	3	3
CO4	estimate the efficiency of reciprocating air compressor	3	3	3	3
CO5	study on boilers and identify the parts of the engine by disassembly	3	3	3	3



MACHINE TOOLS LAB

III-B.Tech.-I-Sem

L T P C

Course Code: 17ME3107PC

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO6	PO14
CO1	perform various operations on lathe and drilling machines	3	3	3	3
CO2	develop simple features by using shaper, planer and milling machines	3	3	3	3
CO3	measure the bores by internal micrometers and dial bore indicators	3	3	3	3
CO4	determine the angle and taper using Bevel protractor and Sine bar	3	3	3	3
CO5	evaluate screw thread parameters	3	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS (AECS) LAB

III-B.Tech-I-Sem

L T P C

Subject Code: 17ME3108HS

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3



HUMAN VALUES AND PROFESSIONAL ETHICS

MANDATORY COURSE (NON-CREDIT)

III-B.Tech-I-Sem

L T P C

Subject Code: 17HS3109MC

3 0 0 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO12
CO1	apply the importance of human values for personal and societal development	3	3	3	2
CO2	develop ethics and professional attitude	2	2	3	2
CO3	explain ethical standards in a professional environment	3	3	3	2
CO4	distinguish between professional rights and employee rights	3	3	3	2
CO5	identify their role in professional spheres	3	3	3	3

QUANTITATIVE APTITUDE

MANDATORY COURSE (NON-CREDIT)

III-B.Tech-I-Sem

L T P C

Subject Code: 17BS3110MC

0 0 2 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	Recall the basics of number systems and apply them accordingly	3	3
CO2	Apply the concepts of percentages, profit and loss, & Interests in real life situations	3	3
CO3	demonstrate various principles related to Distance ,speed ,time and work in solving mathematical problems	3	3
CO4	distinguish between permutations and combinations ,clocks and calendars for solving problems	3	3



CO5	apply principles of geometry and menstruation to achieve qualitative results at workplace	3	3
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THERMAL ENGINEERING - II

III-B.Tech-II-Sem

L T P C

Subject Code: 17ME3201PC

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO12	PO14
CO1	explain Rankine cycle, working of boilers and its accessories	3	3	3	3
CO2	estimate the performance of steam nozzles	3	3	3	3
CO3	evaluate the performance of steam turbines	3	3	3	3
CO4	outline the working of steam condensers, gas turbines and their performance parameters	3	3	3	3
CO5	assess the performance of turbo jet engines	3	3	2	3

HEAT TRANSFER

III-B.Tech-II-Sem

L T P C

Subject Code: 17ME3202PC

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO14
CO1	compute one dimensional steady state conduction heat transfer	3	3	3	3	3
CO2	solve transient heat conduction problems for simple geometries	3	3	3	3	3
CO3	analyze forced and natural convective heat transfer	3	3	3	3	3
CO4	design heat exchangers using LMTD and NTU methods	3	3	3	3	3
CO5	explain the principles of radiation	3	3	3	3	3



DESIGN OF MACHINE MEMBERS – II

III-B.Tech-II-Sem

L T P C

Subject Code: 17ME3203PC

4 1 0 4

Note: Design Data Book is permitted. Design of all components should include design for strength and rigidity apart from engineering performance requirements.

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PO13
CO1	analyse the importance of sliding contact bearings	3	3	2	3	3
CO2	design the different types of rolling contact bearings	3	3	2	3	3
CO3	explain the concepts of springs and power transmission systems	3	3	3	3	3
CO4	design different categories of engine parts	3	3	3	3	3
CO5	evaluate the design procedure for gears and power screws	3	3	3	3	3

GLOBAL WARMING & CLIMATE CHANGE

(Open Elective – II)

III-B.Tech.-II-Sem.

L T P C

Subject Code: 17CE3204OE

3 0 0 3

Pre Requisites: Environmental science

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO7	PO8	PO12
CO1	describe the various consequences of climate change	3	3	3	3	2
CO2	illustrate the methods of measurement of climate change	3	3	3	3	2
CO3	analyze the causes for climate change and its impacts	3	3	3	3	2
CO4	evaluate the impact of global warming and climate change	3	3	3	3	2
CO5	explain various mitigation techniques	3	3	3	3	2



FUNDAMENTALS OF ROBOTICS
(Open Elective – II)

III-B.Tech-II-Sem
Code: 17ME3204OE

L T P C Subject
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2
CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate sensors for robot	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

PRINCIPLES OF COMMUNICATION SYSTEMS

(Open Elective – II)

III -B.Tech.-II-Sem
Subject Code: 17EC3204OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the fundamentals of communication systems	3	2	2	2
CO2	analyze various analog modulation and demodulation schemes	3	3	3	2
CO3	explain sampling theorem, pulse modulation and multiplexing techniques	3	3	3	2
CO4	illustrate digital modulation schemes	3	3	2	2
CO5	develop source and channel coding techniques	3	3	3	2

DATABASE MANAGEMENT SYSTEMS

(Open Elective – II)

III-B.Tech- II Sem
Subject Code: 17CS3204OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2

AUTOMOBILE ENGINEERING
(Professional Elective-I)

III-B.Tech.-II-Sem.

Subject Code: 17ME3205PE

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO12	PO14
CO1	explain various components of the automobile and its functions	3	3	3	3
CO2	outline the cooling and electrical systems in automobile	3	3	3	3
CO3	illustrate the transmission system and function of its elements	3	3	3	3
CO4	demonstrate the elements of braking and steering systems	3	3	3	3
CO5	summarize the emission control methods used in automobiles	3	3	3	3

NANOTECHNOLOGY

(Professional Elective-I)

III-B.Tech.-II-Sem.

Subject Code: 17ME3206PE

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO6	PO7	PO12	PO13
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CO1	describe nano materials based on their dimensionality	3	3	3	3	3	3	3
CO2	correlate properties with structures of nano materials	3	3	3	3	3	3	3
CO3	summerize bottom up and topdown approaches for developing nano materials	3	3	3	3	3	3	3
CO4	choose characterization techniques and study the nano material properties	3	3	3	3	3	3	3
CO5	relate fields of nanotechnology in specific applications	3	3	3	3	3	3	3

AUTOMATION IN MANUFACTURING

(Professional Elective-I)

III-B.Tech-II-Sem

L T P C

Subject Code: 17ME3207PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO13	PO14
CO1	illustrate the fundamentals of CNC part programming	3	3	3	3	3	3
CO2	explain CNC machine elements and system devices	3	3	3	3	3	3
CO3	make use of tooling, cooling and fixturing systems for CNC machines	3	3	3	3	3	3
CO4	create various Rapid Prototyping data files	3	3	3	3	3	3
CO5	outline the various applications of Rapid Prototyping	3	3	3	3	3	3

MECHANICS OF COMPOSITE MATERIALS

(Professional Elective-I)

III-B.Tech-II-Sem

L T P

Subject Code: 17ME3208PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	explain the applications of composite materials	3	3	3	3	3



CO2	illustrate the concepts of fiber reinforced plastic processing	3	3	3	3	3
CO3	differentiate micro and macro mechanics of composite lamina	3	3	3	3	3
CO4	apply failure criteria and critically evaluate the results	3	3	3	3	3
CO5	analyze the mechanical behavior of metal matrix composites	3	3	3	3	3

HEAT TRANSFER LAB

III-B.Tech-II-Sem

L T P C

Subject Code: 17ME3209PC

- - 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO6	PO7	PO14
CO1	find thermal conductivity of common metallic materials	3	3	3	3
CO2	calculate heat transfer rate between fluid and solid boundaries	3	3	3	3
CO3	evaluate the performance of heat exchangers	3	3	3	3
CO4	determine the emissivity and Stefan Boltzmann constant for radiation	3	3	3	3
CO5	estimate heat transfer coefficient in natural,forced convection	3	3	3	3

PRODUCTION DRAWING PRACTICE

III-B.Tech-II-Sem

L T P C

Subject Code: 17ME3210PC

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO6	PO10	PO13	PO14
CO1	explain the concepts of conventional representation of machine components	3	3	3	3	3	3
CO2	apply limits, fits and tolerances for a given part drawing	3	3	3	3	3	3
CO3	represent the types of surface roughness and various treatment indications	3	3	3	3	3	3



CO4	create detailed part drawings including tolerances from assembly using CAD	3	3	3	3	3	3
CO5	create drawing of parts from assembly using CAD software	3	3	3	3	3	3

METROLOGY LAB

III-B.Tech-I-Sem

L T P C

Subject Code: 17ME3211PC

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO6	PO14
CO1	identify methods and devices for measurement of length	3	3	3	3
CO2	make use of methods and devices for measurement of angle	3	3	3	3
CO3	measure gear parameters	3	3	3	3
CO4	compare pitch and flank angle of a screw thread with standard gauge	3	3	3	3
CO5	experiment with tool maker's microscope	3	3	3	3

SOFT SKILLS

MANDATORY COURSE (NON-CREDIT)

III-B.Tech-II-Sem

L T P C

Subject Code: 17HS3212MC

0 0 2 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	identify the need for self awareness and exhibit professional attitude	3	3
CO2	interpret and improve in personal and professional communication	3	3
CO3	develop leadership skills and enhance the employability	3	3
CO4	recognize the importance of decision making and change management to improve professional attributes	3	3
CO5	apply interview techniques for overall development	3	3



CAD/CAM

IV-B.Tech-I-Sem

L T P C

Subject Code: 17ME4101PC

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	describe various CAD devices, software and coordinate systems	3	3	3	3
CO2	apply homogeneous transformations on various geometric models	3	3	3	3
CO3	construct both analytical and synthetic entities using parametric representations	3	3	3	3
CO4	build surface models using different representation schemes	3	3	3	3
CO5	create solid primitives using the different representation schemes	3	3	3	3

INSTRUMENTATION & CONTROL SYSTEMS

IV-B.Tech-I-Sem

L T P C

Subject code: 17ME4102PC

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain dynamic performance characteristics and sources of error	3	2	2
CO2	use various displacement, temperature and pressure measuring instruments	3	2	2
CO3	choose various speed, flow, acceleration & vibration measuring instruments	3	3	2
CO4	select strain, humidity, force, torque and power measuring instruments	3	3	2
CO5	outline various control systems and position controller applications	3	3	2



FINITE ELEMENT METHODS

IV-B.Tech-I-Sem

L T P C

Subject Code: 17ME4103PC

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	explain the fundamentals of FEM	3	2	2	3	3
CO2	solve the linear equations of truss & beam elements using FEM	3	3	3	3	3
CO3	evaluate the load and displacements for 2-D problems	3	3	3	3	3
CO4	apply the FE method for heat transfer problems	3	3	3	3	3
CO5	demonstrate the dynamic analysis for various objects using FEM	3	3	2	3	3

ENVIRONMENTAL IMPACT ASSESSMENT

(Open Elective – III)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: 17CE4104OE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO10	PO12
CO1	identify the attributes to be considered for EIA	3	3	3	3
CO2	assess impact of deforestation	3	3	3	3
CO3	interpret impact prediction, significance of soil quality and mitigation	3	3	2	3
CO4	conduct environmental audit and prepare reports	3	3	2	3
CO5	illustrate environmental policies and provisions	3	3	3	3

PRINCIPLES OF ENTREPRENEURSHIP

(Open Elective – III)

IV-B.Tech. I-Sem.

L T P C

Subject Code: 17ME4104OE

3 0 0 3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3

PRINCIPLES OF EMBEDDED SYSTEMS

(Open Elective – III)

IV -B.Tech.-I-Sem

L T P C

Subject Code: 17EC4104OE

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the basic concepts of embedded computing	3	3	2	2
CO2	illustrate the architecture of 8051 microcontroller	3	3	3	2
CO3	develop embedded programs using 8051 microcontroller	3	3	3	2
CO4	demonstrate 8051 microcontroller interface with peripherals	3	3	3	2
CO5	explain real time operating system concepts	3	3	3	3

WEB TECHNOLOGIES

(Open Elective – III)

IV – B.Tech. – I - Semester

L T P C

Subject Code: 17CS4104OE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
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CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2

OPERATIONS RESEARCH

(Professional Elective-II)

IV-B.Tech-I-Sem

L T P C

Subject Code: 17ME4105PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO14
CO1	formulate and solve LPP using various methods	3	3	3	3	3
CO2	solve transportation and assignment problems	3	3	3	3	3
CO3	compute sequencing and inventory model problems	3	3	3	3	3
CO4	analyze waiting lines and replacement problems	3	3	3	3	3
CO5	evaluate game theory and dynamic programming problems	3	3	3	2	3

POWER PLANT ENGINEERING

(Professional Elective-II)

IV-B.Tech-I-Sem

L T P C

Subject Code: 17ME4106PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO14
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CO1	illustrate energy sources, steam power plants and combustion process	3	2	2	3	3
CO2	explain the working principles of diesel and gas-turbine power plants	3	2	2	3	3
CO3	demonstrate hydro electric power plant with various layouts	3	3	2	3	3
CO4	outline the concepts of nuclear power plants	3	3	2	3	3
CO5	determine optimum parameters for power plants	3	3	2	3	3

INDUSTRIAL ENGINEERING

(Professional Elective-II)

IV-B.Tech-I-Sem

L T P C

Subject Code: 17ME4107PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO8	PO11	PO12
CO1	explain principles of industrial engineering and management	3	3	3	3	3
CO2	design various organizational structures	3	3	2	3	3
CO3	illustrate principles of operations management and line balancing	3	3	3	3	3
CO4	analyze the work study and establish limits using SQC	3	3	3	3	3
CO5	assess the methods of job evaluation and project management	3	3	3	3	3

UNCONVENTIONAL MACHINING PROCESSES

(Professional Elective-II)

IV-B.Tech-I-Sem

L T P C

Subject Code: 17ME4108PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO14
CO1	explain modern machining processes and principles of USM	3	3	3	3	3



CO2	outline working principles of AJM, WJM and AWJM techniques	3	3	3	3	3
CO3	demonstrate working principles of EDM, EDG and EDW	3	3	3	3	3
CO4	illustrate working principles of EBM, LBM and PAM processes	3	3	3	3	3
CO5	adapt working principles of CM and ECM processes	3	3	3	3	3

CAD/CAM LAB

IV-B.Tech-I-Sem

L T P C

Subject Code: 17ME4109PC

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PO14
CO1	construct geometric models using CAD packages	3	3	3	3
CO2	analyze the stress distribution in structures using FEA packages	3	3	3	3
CO3	evaluate thermal gradients using FEA packages	3	3	3	3
CO4	develop part programming for various contours	3	3	3	3
CO5	adapt CNC technology for manufacturing simple components	3	3	3	3

INSTRUMENTATION AND CONTROL SYSTEMS LAB

IV-B.Tech - I- Sem

L T P C

Subject Code: 17ME4110PC

0 0 3 2

Pre-requisites: Basic principles of Instrumentation and control systems

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5
CO1	calibrate the measuring devices	3	3	3
CO2	demonstrate pressure, displacement and vibration measuring devices	3	3	3



CO3	analyze the temperature measuring devices	3	3	3
CO4	determine the speed using photo and magnetic speed pickups	3	3	3
CO5	perform and calibrate rotameter for flow measurement	3	3	3

FOREIGN LANGUAGE: FRENCH

MANDATORY COURSE (NON-CREDIT)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: 17HS4112MC

3 0 0 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	identify the basic structure of French language, spelling and pronunciation	3	3
CO2	reproduce the grammatical structure for basic communication	3	3
CO3	recognize and use the grammatical structures for general comprehension	3	3
CO4	use the grammatical and lexical notions in formal and informal situations	3	3
CO5	apply the language skills in communicating effectively at a global platform	3	3

FOREIGN LANGUAGE: GERMAN

MANDATORY COURSE (NON-CREDIT)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: 17HS4113MC

3 0 0 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	identify the basic structure of German language, spelling and pronunciation	3	3
CO2	reproduce the grammatical structure for self introduction	3	3
CO3	recognize and use the grammatical article structures for basic conversation	3	3



CO4	use the grammatical and verb structure for formal and informal situations	3	3
CO5	apply the language skills in communicating effectively at a global platform	3	3

ROBOTICS

IV-B.Tech-II-Sem

L T P C

Subject Code: 17ME4201PC

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO14
CO1	select suitable end effectors for industrial automation	3	3	3	3
CO2	perform kinematic analysis on end-effector positioning	3	3	3	3
CO3	estimate forces using dynamic formulation	3	3	3	3
CO4	plan path of the end effector using feedback components	3	3	3	3
CO5	apply the robot technologies in various industrial applications	3	3	3	3

RENEWABLE ENERGY SYSTEMS

(Professional Elective-III)

IV-B.Tech-II-Sem

L T P C

Subject Code: 17ME4202PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO7	PO12	PO14
CO1	analyze global and national energy scenarios	3	3	3	3	3
CO2	illustrate the various solar energy systems	3	3	3	3	3
CO3	demonstrate the aspects related to wind energy power plants	3	3	3	3	3
CO4	build the power plants using bio gas	3	3	3	3	3



CO5	estimate the power generation in hydroelectric plants	3	3	3	3	3
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MACHINE TOOL DESIGN

(Professional Elective-III)

IV-B.Tech-II-Sem

L T P C

Subject Code: 17ME4203PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO12	PO13	PO14
CO1	synthesize of machine tool mechanisms	3	3	3	3	3	3	3
CO2	select speed ranges in machine drives	3	3	3	3	3	3	3
CO3	design feed gear boxes	3	3	3	3	3	3	3
CO4	summarize about spindles of various machine tools	3	3	3	3	3	3	3
CO5	classify various controls used in machine tools	3	3	3	3	3	3	3

NEURAL NETWORKS AND FUZZY LOGICS

(Professional Elective-III)

IV-B.Tech-II-Sem

L T P C

Subject Code: 17ME4204PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO12	PO13	PO14
CO1	summarize characteristics and applications of ANN	3	3	3	3	3	3	3
CO2	illustrate perceptron models, networks and training algorithms	3	3	3	3	3	3	3
CO3	make use of various associative memories	3	3	3	3	3	3	3
CO4	analyze hopfield networks	3	3	3	3	3	3	3
CO5	explain various concepts of fuzzy logics	3	3	3	3	3	3	3



PRODUCTION PLANNING AND CONTROL
(Professional Elective-III)

IV-B.Tech-II-Sem

L T P C

Subject Code: 17ME4205PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO11	PO12	PO14
CO1	illustrate the functions of PPC	3	3	2	3	3
CO2	outline the principles and types of forecasting	3	3	2	3	3
CO3	differentiate various inventory control techniques	3	3	3	3	3
CO4	solve routing and scheduling problems	3	3	3	3	3
CO5	summarize dispatching process	3	3	3	3	3

FLUID POWER SYSTEMS
(Professional Elective-IV)

IV-B.Tech-II-Sem

L T P C

Subject Code: 17ME4206PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	classify components of hydraulic systems	3	3	3	3	3
CO2	compare components of pneumatic systems	3	3	3	3	3
CO3	design fluid power circuits for industrial applications	3	3	3	3	3
CO4	build electro fluid power circuits	3	3	3	3	3
CO5	develop fluid power circuits for industrial automation	3	3	3	3	3



COMPUTATIONAL FLUID DYNAMICS
(Professional Elective-IV)

IV-B.Tech-II-Sem

L T P C

Subject Code: 17ME4207PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO13
CO1	distinguish various numerical methods used in CFD	3	3	3	3	3
CO2	explain the basic rules of FVM	3	3	3	3	3
CO3	apply FVM to solve convection and diffusion problems	3	3	3	3	3
CO4	solve flow field problems using CFD	3	3	3	3	3
CO5	analyze turbulent flows by applying CFD concepts	3	3	3	3	3

FLEXIBLE MANUFACTURING SYSTEMS
(Professional Elective-IV)

IV-B.Tech.-II-Sem

L T P C

Subject Code: 17ME4208PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO14
CO1	explain the concepts of FMS	3	3	3	3
CO2	make use of automated material handling systems	3	3	3	3
CO3	perform engineering analysis of ASRS	3	3	3	3
CO4	identify bottlenecks in FMS operational issues	3	3	3	3
CO5	summarize the concepts of JIT and lean manufacturing	3	3	3	3



ADVANCED MECHANICS OF SOLIDS

(Professional Elective-IV)

IV-B.Tech-II-Sem

L T P C

Subject Code: 17ME4209PE

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO13
CO1	apply concepts of stress and strain analyses in solids	3	3	3	3	3
CO2	solve the constitutive equations of bending of cantilever beams	3	3	3	3	3
CO3	assess stress concentration using stress functions	3	3	3	3	3
CO4	solve unsymmetric bending problems	3	3	3	3	3
CO5	determine deflections and deformations using energy methods	3	3	3	3	3



DEPARTMENT OF MECHANICAL ENGINEERING (R18)

ENGINEERING MATHEMATICS – I

(Linear Algebra and Calculus)

I-B.Tech-I-Sem.

Subject Code BSC-101

L T P C

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	analyze the nature of sequences and series	3	2	1
CO4	verify mean value theorems and evaluation of improper integrals by using Beta and Gamma functions	3	2	1
CO5	find the extreme values of functions of two variables	3	2	1

ENGINEERING PHYSICS

I-B.Tech.-I-Sem.

Subject Code: BSC-105

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	compare simple and damped harmonic oscillations	3	2	1
CO2	illustrate the interference and diffraction phenomena of light	3	2	1
CO3	examine the mechanism of various lasers and holography	3	2	1
CO4	demonstrate the propagation of light in optical fiber	3	2	1
CO5	analyze the properties of nanomaterials	3	2	1



ENGLISH

I-B.Tech.-I-Sem.

L T P C

Subject Code: HSMC-101

2 - - 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	compare simple and damped harmonic oscillations	3	2	1
CO2	illustrate the interference and diffraction phenomena of light	3	2	1
CO3	examine the mechanism of various lasers and holography	3	2	1
CO4	demonstrate the propagation of light in optical fiber	3	2	1
CO5	analyze the properties of nanomaterials	3	2	1

PROGRAMMING FOR PROBLEM SOLVING

I-B.Tech.- I- Sem.

L T P C

Subject Code: ESC-103

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

ENGINEERING GRAPHICS

I -B.Tech-I-Sem.

L T P C

Subject Code: ESC-109

1 - 4 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
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CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2

ENGINEERING PHYSICS LAB

I-B.Tech.-I-Sem.

L T P C

Subject Code: BSC-106

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	evaluate the physical constants and frequency by using simple harmonic vibrations	3
CO2	compare practical results with theoretical calculations in electromagnetic theory and electrical circuits	3
CO3	demonstrate the properties of lasers and optical fibers	3
CO4	find the energy gap of a semiconductor and identify its band structure	3
CO5	demonstrate the interference and dispersion phenomena of light	3

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

I- B.Tech-I-Sem.

L T P C

Subject Code: HSMC-102

- - 2 1

The **Language Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	identify the nuances of the language through multimedia experience	3	3



CO2	express clearly with right accent, intonation to overcome MTI	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3
CO4	develop speaking and listening skills	3	3
CO5	appraise communication and correspond effectively	3	3

PROGRAMMING FOR PROBLEM SOLVING LAB

I- B.Tech-I-Sem.

L T P C

Subject Code: ESC-104

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3
CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3

TECHNOLOGY EXPLORATION FOR SOCIAL INNOVATION LAB - I MANDATORY COURSE (NON-CREDIT)

I-B.Tech.-I-Sem.

L T P C

Subject Code: MC-101

- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	identify the problems	3
CO2	illustrate social innovation	3
CO3	choose suitable processes	3
CO4	design suitable prototype	3
CO5	develop feasibility report	3



ENGINEERING MATHEMATICS – II
(Advanced Calculus)

I-B.Tech.-II-Sem.

Subject Code: BSC-102

L T P C

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve linear and non-linear partial differential equations	3	2	1
CO3	evaluate the line, surface and volume integrals and convert them from one to another by using multiple integrals	3	2	1
CO4	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

ENGINEERING CHEMISTRY

I-B.Tech.-II-Sem

Subject Code: BSC-107

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1
CO4	illustrate the various fuels, synthesis of polymers and drugs	3	2	1
CO5	analyze the properties of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

I- B.Tech. II-Sem.

Subject Code: ESC-101

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	explain the concepts of single phase and three phase AC circuits	3	3	2	1
CO3	elaborate the working principles and construction of AC and DC machines	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1

ENGINEERING MECHANICS

I- B.Tech.- II-Sem.

L T P C

Course Code: ESC-107

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	analyze the resultant of a system of forces using principles of mechanics	3	2	1
CO2	apply the conditions of static equilibrium to particles and rigid bodies	3	2	1
CO3	determine mechanical efficiency of simple lifting machines, centroid and centre of gravity of simple sections	3	2	1
CO4	compute the second moment of inertia of various laminas and bodies	3	2	1
CO5	solve the problems involving kinetics and virtual work of particles	3	2	1

ENGINEERING CHEMISTRY LAB

I-B.Tech.-II-Sem

L T P C

Subject Code: BSC-108

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	determine the hardness in water samples to solve societal problems	3
CO2	estimate the strength of the given solutions	3



CO3	analyze adsorption and viscosity of various fluids	3
CO4	synthesize the various organic compounds used in medical industry	3
CO5	verify and understand the distribution coefficient	3

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB

I-B.Tech.-II-Sem.
Subject Code: ESC-102

L T P C
- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws and network theorems	3
CO2	find the efficiency of AC and DC machines	3
CO3	verify the V-I characteristics of various electronic devices	3
CO4	determine the efficiency of various rectifiers	3
CO5	illustrate the configurations of Bi-polar junction transistor	3

ENGINEERING MECHANICS LAB

I-B.Tech.-II-Sem.
Subject Code: ESC-108

L T P C
- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3
CO1	determine the resultant of a given system of forces	3
CO2	determine the moment of inertia of a body and support reactions of a given beam	3
CO3	apply the principle of moments to calculate unknown forces	3
CO4	compare frictional forces between two surfaces	3
CO5	estimate the mechanical advantage and velocity ratio for simple machines	3



IT & ENGINEERING WORKSHOP

I-B.Tech.-II-Sem.

L T P C

Subject Code: ESC-110

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	install and make use of operating systems and MS office tools	3	3	2	2
CO2	configure fire walls and trouble shoot network connections	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2

TECHNOLOGY EXPLORATION FOR SOCIAL INNOVATION LAB - II

MANDATORY COURSE (NON-CREDIT)

I-B.Tech.-II-Sem.

L T P C

Subject Code: MC-102

- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	deploy suitable mechanisms	3
CO2	develop platform based innovations	3
CO3	demonstrate data acquisition and analytical skills	3
CO4	execute projects using suitable management techniques	3
CO5	adapt ethics and code of conduct	3

NUMERICAL AND STATISTICAL METHODS

II-B.Tech.-I-Sem.

L T P C

Subject Code: BSC-201

3 1 - 4



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve transcendental, linear and non-linear system of equations using numerical methods	3	2	1
CO2	find the numerical solutions for first order initial value problems and integrals	3	2	1
CO3	differentiate among random variables involved in the probability model	3	2	1
CO4	test hypothesis for small and large samples	3	2	1
CO5	identify the correlation coefficients, strength, direction and significance level	3	2	1

THERMODYNAMICS**II-B.Tech.-I-Sem.****L T P C****Subject Code: ESC-204****3 - - 3****Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)**

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO14
CO1	explain various thermodynamic systems and processes	3	3	2	3
CO2	apply the basic laws of thermodynamics	3	3	2	3
CO3	evaluate the performance of energy conversion devices	3	3	2	3
CO4	find property values during process using mixture of gasses concepts	3	3	2	3
CO5	assess performance parameters of thermodynamic cycles	3	3	2	3

MATERIALS ENGINEERING**II-B.Tech-I-Sem****L T P C****Subject Code: ESC -205****3 - - 3****Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)**

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the concepts of structure of metals and constitution of alloys	3	2	1
CO2	construct and interpret equilibrium phase diagrams	3	2	1
CO3	analyze the material properties of ferrous and non-ferrous alloys	3	2	1



CO4	apply various heat treatment methods to steels	3	2	1
CO5	outline the properties, applications of ceramic and composite materials	3	2	1

SOLID MECHANICS

II-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PCC-211

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO13
CO1	determine the stress and strain of various materials	3	3	2	2	3
CO2	sketch the shear force and bending moment diagrams for beams of various supports and loads	3	3	2	3	3
CO3	analyze flexural and shear stresses in a beam	3	3	3	2	3
CO4	evaluate principal stresses, strains and various theories of failure	3	3	3	3	3
CO5	determine stresses and deformations in shafts and thin cylinders	3	3	2	2	3

INSTRUMENTATION & CONTROL SYSTEMS

II-B.Tech.-I-Sem.

L T P C

Subject code: ME-PCC-212

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain dynamic performance characteristics and sources of error	3	2	2
CO2	use various displacement, temperature and pressure measuring instruments	3	2	2
CO3	choose various speed, flow, acceleration & vibration measuring instruments	3	3	2
CO4	select strain, humidity, force, torque and power measuring instruments	3	3	2
CO5	outline various control systems and position controller applications	3	3	2



MATERIALS ENGINEERING LAB

II-B.Tech.-I-Sem.

L T P C

Subject code: ESC-206

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5
CO1	interpret crystal structure and necessity of alloying	3	3	3
CO2	perform metallographic characterization of metals and metal alloys	3	3	3
CO3	plot the hardness variations of heat treated and non-heat treated steels	3	3	3
CO4	select materials for various engineering applications	3	3	3
CO5	apply the skills and modern techniques for latest materials	3	3	3

SOLID MECHANICS LAB

II-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PCC-213

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO13
CO1	analyze stress-strain relationship for given material	2	3	3
CO2	assess the flexural strength for given member	2	3	3
CO3	determine shear modulus of shaft and stiffness of spring	2	3	3
CO4	find the hardness and compressive strength of given material	2	3	3
CO5	measure toughness using Charpy and Izod tests	2	3	3

INSTRUMENTATION AND CONTROL SYSTEMS LAB

II-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PCC-214

- - 2 1



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5
CO1	calibrate the measuring devices	3	3	3
CO2	demonstrate pressure, displacement and vibration measuring devices	3	3	3
CO3	analyze the temperature measuring devices	3	3	3
CO4	determine the speed using photo and magnetic speed pickups	3	3	3
CO5	perform and calibrate rotameter for flow measurement	3	3	3

COMPUTATIONAL MATHEMATICS LAB USING Sci LAB

II-B.Tech.-I-Sem.

L T P C

Subject Code: BSC-203

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO14
CO1	solve problems on Linear Algebra and plotting of Graphs	3	3	3	3
CO2	find roots of an equation using various Methods	3	3	3	3
CO3	fit a curve for straight line, parabola, exponential and power curves	3	3	3	3
CO4	solve ordinary differential equations using Numerical techniques	3	3	3	3
CO5	solve ordinary integral equations using Numerical techniques	3	3	3	3

**GENDER SENSITIZATION LAB
(MANDATORY COURSE- NON- CREDIT)**

II-B.Tech.-I-Sem

L T P C

Subject Code: MC-201

- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2



CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

DESIGN OF MACHINE ELEMENTS – I

II-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-221

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PO13
CO1	explain the design procedure and select materials for specific application	3	3	2	3	3
CO2	evaluate the strength, stiffness and fatigue of machine elements	3	3	2	3	3
CO3	design riveted, welded and bolted joints	3	3	3	3	3
CO4	design keys, cotter, knuckle joints	3	3	3	3	3
CO5	design shafts and couplings	3	3	3	3	3

APPLIED THERMODYNAMICS-I

II-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-222

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO12	PO14
CO1	explain functioning of various IC engines	2	2	2	3
CO2	illustrate combustion phenomena in IC Engines	3	2	3	3
CO3	evaluate the effect of various operating variables on engine performance	3	2	3	3
CO4	analyze operating principles of different types of compressors	3	2	2	3
CO5	determine the efficiency of axial flow compressors	3	2	2	3

FLUID MECHANICS & HYDRAULIC MACHINERY

II-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-223

3 - - 3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the concepts of fluid statics	3	3	2	2
CO2	describe the concepts of fluid kinematics and dynamics	3	3	3	3
CO3	analyze flow through different pipes and boundary layer theory	3	3	3	3
CO4	select suitable turbine for given heads	3	3	3	2
CO5	estimate performance parameters of hydraulic machines	3	3	3	3

KINEMATICS OF MACHINERY

II-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-224

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	illustrate concepts of kinematics and mechanisms of machines	3	3	2	2
CO2	evaluate velocity and acceleration of simple mechanisms	3	3	3	2
CO3	explain working principle of various straight line mechanisms	3	3	2	2
CO4	develop cam profiles based on follower motion	3	3	3	2
CO5	solve problems related to gears and gear trains	3	3	3	3

MANUFACTURING PROCESSES

II-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-225

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO14
CO1	explain concepts of various casting techniques	3	3	2	3
CO2	differentiate various welded joints	3	3	2	3
CO3	distinguish the process details of soldering, brazing and welding	3	3	3	3



CO4	illustrate various techniques of metal working	3	3	2	3
CO5	distinguish various extrusion and forging techniques	3	3	3	3

APPLIED THERMODYNAMICS LAB

II-B.Tech.-II-Sem.

Subject Code: ME-PCC-226

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO7	PO14
CO1	construct valve timing diagram and test the performance of IC engines	3	3	3	3
CO2	find engine frictional power by motoring, retardation and Morse tests	3	3	3	3
CO3	determine volumetric efficiency of IC engines	3	3	3	3
CO4	estimate the efficiency of reciprocating air compressor	3	3	3	3
CO5	study on boilers and identify the parts of the engine by disassembly	3	3	3	3

FLUID MECHANICS AND HYDRAULIC MACHINERY LAB

II-B.Tech.-II-Sem.

Subject code: ME-PCC-227

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO14
CO1	find co-efficient of discharge for the venturimeter and orifice meter	2	3	2
CO2	determine minor losses and friction factor for a given pipeline	2	3	2
CO3	verify Bernoulli's equation	2	3	2
CO4	calculate impact of force of Jet on different types of Vanes	2	3	2
CO5	analyze the performance of various turbines and pumps	2	3	2



MANUFACTURING PROCESSES LAB

II-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-228

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO14
CO1	perform the casting process in manufacturing of different types products	3	3	3
CO2	determine the properties of different types of moulding sands	3	3	3
CO3	illustrate different welding processes required for fabrication	3	3	3
CO4	test the various metal forming processes	3	3	3
CO5	make use of blow and injection moulding equipment	3	3	3

MACHINE DRAWING USING AutoCAD

II-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-229

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO6	PO10	PO13	PO14
CO1	apply the principles of engineering drawing in machine drawing	3	3	3	3	3	3
CO2	make use of conventional representation of materials and machine components	3	3	3	3	3	3
CO3	illustrate various permanent and temporary Fasteners, Joints and Couplings	3	3	3	3	3	3
CO4	develop assembly drawings from the given part drawing and vice versa	3	3	3	3	3	3
CO5	construct computer aided drawings using CAD software package	3	3	3	3	3	3

ENVIRONMENTAL SCIENCES

MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-II-Sem.

L T P C

Subject Code: MC-202

2 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2

DYNAMICS OF MACHINERY

III-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PCC-311

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the concepts of Gyroscopes, static and dynamic force analysis	3	3	2	3
CO2	illustrate turning moment diagrams and design of fly wheels	3	3	2	3
CO3	outline the concepts of friction-clutches, brakes and dynamometers	3	3	2	3
CO4	analyze balancing of rotating masses and characteristics of governors	3	3	2	3
CO5	summarize free and forced vibrations	3	3	2	3



MACHINE TOOLS AND METROLOGY

III-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PCC-312

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO14
CO1	explain cutting tool geometry, types of lathes and chip formation	3	3	3	3	3
CO2	illustrate operations of drilling, and boring machines	3	3	2	3	3
CO3	make use of the operations of milling and grinding machines	3	3	2	3	3
CO4	analyze the limits and tolerances for engineering components	3	3	3	3	3
CO5	test surface roughness of part and tool alignment	3	3	3	3	3

HEAT TRANSFER

III-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PCC-313

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO14
CO1	compute one dimensional steady state conduction heat transfer	3	3	3	3	3
CO2	solve transient heat conduction problems for simple geometries	3	3	3	3	3
CO3	analyze forced and natural convective heat transfer	3	3	3	3	3
CO4	design heat exchangers using LMTD and NTU methods	3	3	3	3	3
CO5	explain the principles of radiation	3	3	3	3	3

DESIGN OF MACHINE ELEMENTS – II

III-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PCC-314

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PO13
CO1	analyse the importance of sliding contact bearings	3	3	2	3	3
CO2	design the different types of rolling contact bearings	3	3	2	3	3
CO3	explain the concepts of springs and power transmission systems	3	3	3	3	3
CO4	design different categories of engine parts	3	3	3	3	3
CO5	evaluate the design procedure for gears and power screws	3	3	3	3	3

APPLIED THERMODYNAMICS – II

III-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PCC-315

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO12	PO14
CO1	explain Rankine cycle, working of boilers and its accessories	3	3	3	3
CO2	estimate the performance of steam nozzles	3	3	3	3
CO3	evaluate the performance of steam turbines	3	3	3	3
CO4	outline the working of steam condensers, gas turbines and their performance parameters	3	3	3	3
CO5	assess the performance of turbo jet engines	3	3	2	3

KINEMATICS AND DYNAMICS LAB

III-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PCC-316

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO13
CO1	estimate primary & secondary forces for dynamic balancing of rotary masses	3	3	3
CO2	analyse the response of different vibrating systems	3	3	3
CO3	test the performance of governors	3	3	3



CO4	determine the effect of gyroscope for different motions	3	3	3
CO5	analyze cam profile	3	3	3

HEAT TRANSFER LAB

III-B.Tech.-I-Sem.

L T P C

Subject code: ME-PCC-317

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO6	PO7	PO14
CO1	find thermal conductivity of common metallic materials	3	3	3	3
CO2	calculate heat transfer rate between fluid and solid boundaries	3	3	3	3
CO3	evaluate the performance of heat exchangers	3	3	3	3
CO4	determine the emissivity and Stefan Boltzmann constant for radiation	3	3	3	3
CO5	estimate heat transfer coefficient in natural,forced convection	3	3	3	3

MACHINE TOOLS AND METROLOGY LAB

III-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PCC-318

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO6	PO14
CO1	perform various operations on lathe and drilling machines	3	3	3	3
CO2	develop simple features by using shaper, planer and milling machines	3	3	3	3
CO3	measure the bores by internal micrometers and dial bore indicators	3	3	3	3
CO4	determine the angle and taper using Bevel protractor and Sine bar	3	3	3	3
CO5	evaluate screw thread parameters	3	3	3	3



DESIGN OF MACHINE ELEMENTS USING CAD LAB

III-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PCC-319

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO6	PO10	PO13	PO14
CO1	identify the different types of keys, fasteners and machine element parts	3	3	3	3	3	3
CO2	visualize and prepare detailed drawing of a given object	3	3	3	3	3	3
CO3	draw details and assembly of mechanical systems	3	3	3	3	3	3
CO4	interpret a given machine component drawing	3	3	3	3	3	3
CO5	create 2-D and 3-D models using CATIA with manufacturing considerations	3	3	3	3	3	3

EMPLOYABILITY SKILLS – I

MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-I-Sem.

L T P C

Subject Code: MC-311

3 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3
CO3	build proficiency in quantitative reasoning	3	3
CO4	improve critical thinking skills	3	3
CO5	exhibit confidence in facing the interview process	3	3



SUMMER INTERNSHIP - I
MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-I-Sem.

L T P C

Subject Code: MC-312

- - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

OPERATIONS RESEARCH

III-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-321

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO14
CO1	formulate and solve LPP using various methods	3	3	3	3	3
CO2	solve transportation and assignment problems	3	3	3	3	3
CO3	compute sequencing and inventory model problems	3	3	3	3	3
CO4	analyze waiting lines and replacement problems	3	3	3	3	3
CO5	evaluate game theory and dynamic programming problems	3	3	3	2	3



COMPUTER AIDED DESIGN

III-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-322

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	describe various CAD devices, software and coordinate systems	3	3	3	3
CO2	apply homogeneous transformations on various geometric models	3	3	3	3
CO3	construct both analytical and synthetic entities using parametric representations	3	3	3	3
CO4	build surface models using different representation schemes	3	3	3	3
CO5	create solid primitives using the different representation schemes	3	3	3	3

AUTOMATION IN MANUFACTURING

III-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-323

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO13
CO1	illustrate the fundamentals of CNC part programming	3	3	3	3	3
CO2	explain CNC machine elements and system devices	3	3	3	3	3
CO3	make use of tooling, cooling and fixturing systems for CNC machines	3	3	3	3	3
CO4	create various Rapid Prototyping data files	3	3	3	3	3
CO5	outline the various applications of Rapid Prototyping	3	3	3	3	3



RENEWABLE ENERGY SOURCES

(Professional Elective – I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PEC-301

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO7	PO12	PO14
CO1	illustrate the principles of solar radiation	3	3	2	3	3
CO2	utilize the applications of solar energy system	3	3	2	3	3
CO3	make use of wind energy and bio mass for power production	3	3	2	3	3
CO4	extract power from geothermal and tidal energy sources	3	3	2	3	3
CO5	explain the various energy conversion systems	3	3	2	3	3

INDUSTRIAL ENGINEERING

(Professional Elective – I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PEC-302

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO8	PO11	PO12
CO1	explain principles of industrial engineering and management	3	3	3	3	3
CO2	design various organizational structures	3	3	2	3	3
CO3	illustrate principles of operations management and line balancing	3	3	3	3	3
CO4	analyze the work study and establish limits using SQC	3	3	3	3	3
CO5	assess the methods of job evaluation and project management	3	3	3	3	3



UNCONVENTIONAL MACHINING PROCESSES

(Professional Elective – I)

III-B.Tech.-II-Sem

L T P C

Course Code: ME-PEC-303

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO14
CO1	explain modern machining processes and principles of USM	3	3	3	3	3
CO2	outline working principles of AJM, WJM and AWJM techniques	3	3	3	3	3
CO3	demonstrate working principles of EDM, EDG and EDW	3	3	3	3	3
CO4	illustrate working principles of EBM, LBM and PAM processes	3	3	3	3	3
CO5	adapt working principles of CM and ECM processes	3	3	3	3	3

FINITE ELEMENT ANALYSIS

(Professional Elective – I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PEC-304

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	explain the fundamentals of FEM	3	2	2	3	3
CO2	solve the linear equations of truss & beam elements using FEM	3	3	3	3	3
CO3	evaluate the load and displacements for 2-D problems	3	3	3	3	3
CO4	apply the FE method for heat transfer problems	3	3	3	3	3
CO5	demonstrate the dynamic analysis for various objects using FEM	3	3	2	3	3



DISASTER MANAGEMENT

(Open Elective - I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-301

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

FUNDAMENTALS OF OPERATIONS RESEARCH

(Open Elective-I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-302

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	formulate and solve linear programming problem using various methods	3	2	3
CO2	solve transportation and assignment problems	3	3	3
CO3	compute sequencing and inventory model problems	2	2	3
CO4	analyze waiting lines and game theory problems	3	3	3
CO5	evaluate replacement and dynamic programming problems	2	3	3



ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Open Elective-I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-303

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

JAVA PROGRAMMING

(Open Elective-I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-304

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	create packages and interfaces	3	2	3	3	2
CO4	build efficient code using multithreading and exception handling	3	2	3	3	2
CO5	design real-time applications using applets	3	2	3	3	2



INDIAN CULTURE AND CONSTITUTION

(Open Elective-I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-305

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	1
CO2	explain features of languages, religions and holy books	3	2
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	2

AUTOMATION IN MANUFACTURING LAB

III-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-324

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PO14
CO1	develop part programming for lathe and mill operations using CAM software	3	3	3	3
CO2	produce components on CNC lathe	3	3	3	3
CO3	manufacture components on CNC Milling machine	3	3	3	3
CO4	generate .stl files from the models	3	3	3	3
CO5	create components on 3D Printer	3	3	3	3



PRODUCTION DRAWING PRACTICE USING CAD

III-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-325

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO6	PO10	PO13	PO14
CO1	explain the concepts of conventional representation of machine components	3	3	3	3	3	3
CO2	apply limits, fits and tolerances for a given part drawing	3	3	3	3	3	3
CO3	represent the types of surface roughness and various treatment indications	3	3	3	3	3	3
CO4	create detailed part drawings including tolerances from assembly using CAD	3	3	3	3	3	3
CO5	create drawing of parts from assembly using CAD software	3	3	3	3	3	3

COMPUTER AIDED ANALYSIS LAB

III-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PCC-326

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PO14
CO1	determine the deflections and stresses in trusses and beams	3	3	3	3
CO2	find the stresses in 2D structural members	3	3	3	3
CO3	develop harmonic and mode shapes for variety of beams	3	3	3	3
CO4	perform heat transfer analysis involving conduction and convection	3	3	3	3
CO5	conduct thermal stress analysis	3	3	3	3



ADVANCED ENGLISH COMMUNICATION SKILLS LAB

III-B.Tech.-II-Sem.

L T P C

Subject Code: HSMC-301

1 - 2 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3

EMPLOYABILITY SKILLS – II

MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-II-Sem.

L T P C

Subject Code: MC-321

3 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	make use of soft skills to become a professional team member	3	3
CO2	develop professional correspondence skills	3	3
CO3	apply knowledge of decision making, leadership, motivation	3	3
CO4	adapt principles of quantitative aptitude to achieve qualitative results	3	3
CO5	exhibit confidence in facing the interview process	3	3



MANAGEMENT, ECONOMICS AND ACCOUNTANCY

IV-B.Tech.-I-Sem.

L T P C

Subject Code: HSMC-401

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	apply principles of management in professional career	3	2
CO2	make use of principles of economics for decision making	3	2
CO3	solve problems in the areas of production, cost and price	3	2
CO4	prepare balance sheet and maintain books of accounts	2	3
CO5	analyze financial performance of an enterprise	3	3

ARTIFICIAL INTELLIGENCE AND ROBOTICS

IV-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PCC-411

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	explain the concepts of artificial intelligence	3	3	3	3
CO2	illustrate various heuristic search techniques	3	3	3	3
CO3	relate AI techniques in industrial robotics	3	3	3	3
CO4	analyze the robot motion through direct kinematics	3	3	3	3
CO5	develop program to control industrial robots	3	3	3	3

AUTOMOBILE ENGINEERING

(Professional Elective – II)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PEC-401

3 - - 3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO12	PO14
CO1	explain various components of the automobile and its functions	3	3	3	3
CO2	outline the cooling and electrical systems in automobile	3	3	3	3
CO3	illustrate the transmission system and function of its elements	3	3	3	3
CO4	demonstrate the elements of braking and steering systems	3	3	3	3
CO5	summarize the emission control methods used in automobiles	3	3	3	3

TOTAL QUALITY MANAGEMENT

(Professional Elective – II)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PEC-405

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO7	PO8	PO12	PO13
CO1	explain the TQM frame work and various quality control techniques	3	3	3	3	3	3	3	3
CO2	identify customer needs and apply benchmarking techniques	3	3	3	3	3	3	3	3
CO3	build organization for TQM using quality management tools	3	3	3	3	3	3	3	3
CO4	assess costs involvement in TQM process	3	3	3	3	3	3	3	3
CO5	apply ISO standards for design and development of products and services	3	3	3	3	3	3	3	3

FLEXIBLE MANUFACTURING SYSTEMS

(Professional Elective – II)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PEC-409

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO14
-----	--	-----	-----	------	------



CO1	explain the concepts of FMS	3	3	3	3
CO2	make use of automated material handling systems	3	3	3	3
CO3	perform engineering analysis of ASRS	3	3	3	3
CO4	identify bottlenecks in FMS operational issues	3	3	3	3
CO5	summarize the concepts of JIT and lean manufacturing	3	3	3	3

DESIGN OF EXPERIMENTS

(Professional Elective – II)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PEC-413

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO11	PO13
CO1	illustrate the experimental design strategies	3	3	3	3	3
CO2	acquire the concepts of two level and three level factors in DOE	3	3	3	3	3
CO3	adapt various techniques to improve reliability	3	3	3	3	3
CO4	apply orthogonal arrays for the improvement of linear graphs	3	3	3	3	3
CO5	evaluate signal to noise ratio for dynamic problems	3	3	3	3	3

REFRIGERATION & AIR-CONDITIONING

(Professional Elective – III)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PEC-402

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PO14
CO1	apply the concepts of refrigeration to various systems	3	3	2	3	3
CO2	analyze the performance of vapor compression systems	3	3	2	3	3
CO3	illustrate the components of refrigeration system	3	3	2	3	3



CO4	outline vapor absorption, steam jet refrigeration systems	3	3	2	3	3
CO5	determine cooling and heating loads in air conditioning systems	3	3	2	3	3

MAINTENANCE AND SAFETY ENGINEERING
(Professional Elective – III)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PEC-406

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO8	PO12	PO13
CO1	explain the concepts of maintenance management and control	3	3	3	3	2	3	3
CO2	differentiate methods of maintenance and inventory control	3	3	3	3	2	3	3
CO3	improve quality and safety in maintenance	3	3	3	3	2	3	3
CO4	estimate the maintenance cost	3	3	3	3	2	3	3
CO5	apply the reliability engineering principles	3	3	3	3	2	3	3

PLANT LAYOUT AND MATERIAL HANDLING

(Professional Elective – III)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PEC-410

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO7	PO12	PO14
CO1	explain the concepts of various plant layouts	3	3	2	3	3
CO2	make use of heuristics in design of plant layout	3	3	2	3	3
CO3	illustrate various types of material handling systems	3	3	2	3	3
CO4	select appropriate material handling systems	3	3	2	3	3
CO5	apply the safety in ergonomics and minimize the material handling costs	3	3	2	3	3



DESIGN OF TRANSMISSION SYSTEMS

(Professional Elective – III)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PEC-414

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO14
CO1	design belts, pulleys and chain drives	3	3	2	3	3
CO2	design spur gears, parallel axis helical gears	3	3	2	3	3
CO3	design bevel, worm and cross helical gears	3	3	2	3	3
CO4	construct the gear box according to the speed variation	3	3	2	3	3
CO5	illustrate design concepts of cams,brakes and clutches	3	3	2	3	3

ENVIRONMENTAL IMPACT ASSESSMENT

(Open Elective-II)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: OEC-401

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO10	PO12
CO1	identify the attributes to be considered for EIA	3	3	3	3
CO2	assess impact of deforestation	3	3	3	3
CO3	interpret impact prediction, significance of soil quality and mitigation	3	3	2	3
CO4	conduct environmental audit and prepare reports	3	3	2	3
CO5	illustrate environmental policies and provisions	3	3	3	3



NON-CONVENTIONAL ENERGY SOURCES

(Open Elective-II)

IV-B.Tech.-I-Sem.

Subject Code: OEC-403

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO12
CO1	analyze global and national energy scenarios	3	3	3
CO2	illustrate the various solar energy systems	3	3	3
CO3	demonstrate the aspects related to wind energy power plants	3	3	3
CO4	build the power plants using bio gas	3	3	3
CO5	estimate the power generation in hydroelectric plants	3	3	3

PRINCIPLES OF COMMUNICATION SYSTEMS

(Open Elective-II)

IV-B.Tech.-I-Sem.

Subject Code: OEC-405

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the fundamentals of communication systems	3	2	2	2
CO2	analyze various analog modulation and demodulation schemes	3	3	3	2
CO3	explain sampling theorem, pulse modulation and multiplexing techniques	3	3	3	2
CO4	illustrate digital modulation schemes	3	3	2	2
CO5	develop source and channel coding techniques	3	3	3	2

DATABASE MANAGEMENT SYSTEMS

(Open Elective-II)

IV-B.Tech.-I-Sem.

Subject Code: OEC-407

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2

INTELLECTUAL PROPERTY RIGHTS

(Open Elective-II)

IV-B.Tech.-I-Sem.

Subject Code: OEC-409

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO8	PO10	PO12
CO1	outline basics of intellectual property law	3	3	2	3	3
CO2	identify the various trademarks	3	3	2	3	3
CO3	analyze patent and copy rights law	3	3	3	3	3
CO4	differentiate trade secret and unfair practice	3	3	3	3	3
CO5	summarize new developments in Intellectual Property Rights	3	3	3	3	3

TECHNICAL WRITING SKILLS LAB

IV-B.Tech.-I-Sem.

Subject Code: HSMC-402

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	make use of language for understanding discourse and make notes	3	3
CO2	demonstrate command over using library resources for academic and other pursuits	3	3
CO3	apply knowledge of English language for creative and academic purposes	3	3



CO4	adapt principles in conveying good professional ethics	3	3
CO5	exhibit thorough awareness on research-oriented activities and career development	3	3

ARTIFICIAL INTELLIGENCE AND ROBOTICS LAB

IV-B.Tech.-I-Sem

L T P C

Course Code: ME-PCC-412

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	illustrate various search techniques	3	3	3
CO2	solve real-time problems using graph theory	3	3	3
CO3	estimate the accuracy and repeatability of the robot arm	3	3	3
CO4	develop programming for robot trajectory motion	3	3	3
CO5	experiment with robot arm for palletizing, pick and place	3	3	3

PROJECT - I

IV-B.Tech.-I-Sem.

L T P C

Subject Code: ME-PRJ-413

- - 6

3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3



SUMMER INTERNSHIP - II
MANDATORY COURSE (NON-CREDIT)

IV-B.Tech.-I-Sem.
Subject Code: MC-411

L T P C
- - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

POWER PLANT ENGINEERING

(Professional Elective – IV)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PEC-403

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO14
CO1	illustrate energy sources, steam power plants and combustion process	3	2	2	3	3
CO2	explain the working principles of diesel and gas-turbine power plants	3	2	2	3	3
CO3	demonstrate hydro electric power plant with various layouts	3	3	2	3	3
CO4	outline the concepts of nuclear power plants	3	3	2	3	3
CO5	determine optimum parameters for power plants	3	3	2	3	3



PRODUCTION PLANNING AND CONTROL

(Professional Elective – IV)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PEC-407

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO11	PO12	PO14
CO1	illustrate the functions of PPC	3	3	2	3	3
CO2	outline the principles and types of forecasting	3	3	2	3	3
CO3	differentiate various inventory control techniques	3	3	3	3	3
CO4	solve routing and scheduling problems	3	3	3	3	3
CO5	summarize dispatching process	3	3	3	3	3

THEORY OF METAL CUTTING

(Professional Elective – IV)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PEC-411

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO12	PO13
CO1	analyze the mechanism involved in chip formation	3	3	2	3	3	3
CO2	explain single and multipoint cutting tool geometry	3	3	2	3	3	3
CO3	evaluate cutting forces and select appropriate material for different types of cutting tools	3	3	2	3	3	3
CO4	identify the type of tool wear and its effect on tool life	3	3	2	3	3	3
CO5	assess the thermal effects in metal cutting and select appropriate cutting fluid	3	3	2	3	3	3



MECHANICS OF COMPOSITE MATERIALS

(Professional Elective – IV)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PEC-415

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	explain the applications of composite materials	3	3	2	3	3
CO2	illustrate the concepts of fiber reinforced plastic processing	3	3	2	3	3
CO3	differentiate micro and macro mechanics of composite lamina	3	3	2	3	3
CO4	apply failure criteria and critically evaluate the results	3	3	2	3	3
CO5	analyze the mechanical behavior of metal matrix composites	3	3	2	3	3

COMPUTATIONAL FLUID DYNAMICS

(Professional Elective – V)

IV-B.Tech.-II-Sem.

L T P C

Course Code: ME-PEC-404

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO14
CO1	distinguish various numerical methods used in CFD	3	3	3	3
CO2	explain the basic rules of FVM	3	3	3	3
CO3	apply FVM to solve convection and diffusion problems	3	3	3	3
CO4	solve flow field problems using CFD	3	3	3	3
CO5	analyze turbulent flows by applying CFD concepts	3	3	3	3



OPTIMIZATION TECHNIQUES

(Professional Elective – V)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PEC-408

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO14
CO1	explain the classical optimization techniques	3	3	3	3
CO2	determine solution for linear problems using optimization techniques	3	3	3	3
CO3	solve unconstrained non linear problems using various methods	3	3	3	3
CO4	provide solution for constrained non linear problems using various methods	3	3	3	3
CO5	find solution for multivariable problems using dynamic programming	3	3	3	3

ADDITIVE MANUFACTURING

(Professional Elective – V)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PEC-412

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13	PO14
CO1	explain the concepts of additive manufacturing	3	3	3	3	3
CO2	differentiate liquid and solid based rapid prototyping systems	3	3	3	3	3
CO3	illustrate powder based rapid prototyping and tooling systems	3	3	3	3	3
CO4	apply various data file formats in 3D printing	3	3	3	3	3
CO5	summarize various rapid prototyping applications	3	3	3	3	3



DESIGN OF PRESS TOOLS, JIGS AND FIXTURES

(Professional Elective – V)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PEC-416

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO13	PO14
CO1	select locating and clamping points on work-piece	3	3	3	3	3	3
CO2	design various types of jigs and fixtures for mechanical applications	3	3	3	3	3	3
CO3	explain the elements of press and dies	3	3	3	3	3	3
CO4	differentiate the functions of bending and drawing dies	3	3	3	3	3	3
CO5	summarize additional forming techniques	3	3	3	3	3	3

GREEN BUILDING TECHNOLOGIES

(Open Elective-III)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-402

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO7	PO12
CO1	explain the fundamentals of energy use and processes in building	3	2	2	2
CO2	identify indoor environmental requirement and its management	3	3	3	2
CO3	assess the impact of solar radiation on buildings	3	3	3	2
CO4	evaluate end-use energy utilization and requirements	3	3	2	2
CO5	adapt audit procedures for energy management	3	3	3	2



FUNDAMENTALS OF ROBOTICS

(Open Elective-III)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-404

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2
CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate mechanical and electrical hardware for robot with feedback control	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

FUNDAMENTALS OF EMBEDDED SYSTEMS

(Open Elective – III)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-406

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the basic concepts of embedded computing	3	3	2	2
CO2	illustrate the architecture of 8051 microcontroller	3	3	3	2
CO3	develop embedded programs using 8051 microcontroller	3	3	3	2
CO4	demonstrate 8051 microcontroller interface with peripherals	3	3	3	2
CO5	explain real time operating system concepts	3	3	3	3



WEB TECHNOLOGIES

(Open Elective – III)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-408

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2

PRINCIPLES OF ENTREPRENEURSHIP

(Open Elective – III)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-410

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3



PROJECT - II

IV-B.Tech.-II-Sem.

L T P C

Subject Code: ME-PRJ-421

- - 22

11

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3

DEPARTMENT OF MECHANICAL ENGINEERING (R20)

LINEAR ALGEBRA & CALCULUS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-101	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO1 2
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	analyze the nature of sequences and series	3	2	1
CO4	verify mean value theorems and evaluate improper integrals by using Beta and Gamma functions	3	2	1
CO5	find the extreme values of functions of two variables	3	2	1

ENGINEERING CHEMISTRY

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-105	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1
CO4	illustrate the various fuels, synthesis of polymers and drugs	3	2	1
CO5	analyze the properties of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-101	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	elaborate the concepts of network theorems & single phase AC circuits	3	3	2	1
CO3	explain three phase AC circuits and P-N Junction Diode	3	3	2	1
CO4	evaluate the functioning of electronic devices and their	3	3	2	1



	applications				
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1

PROBLEM SOLVING WITH C PROGRAMMING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-103	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

ENGINEERING CHEMISTRY LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-106	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	determine the hardness in water samples to solve societal problems	3
CO2	estimate the strength of the given solutions	3
CO3	analyze adsorption and viscosity of various fluids	3
CO4	synthesize the various organic compounds used in medical industry	3
CO5	verify and understand the distribution coefficient	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-102	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws	3
CO2	evaluate network theorems	3
CO3	verify the V-I characteristics of various electronic devices	3
CO4	determine the efficiency of various rectifiers	3
CO5	illustrate the configurations of Bi-polar junction transistor	3



PROBLEM SOLVING WITH C PROGRAMMING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-104	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3
CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3

IT & ENGINEERING WORKSHOP PRACTICE

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-108	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	execute simple programs using Sci Lab	3	3	2	2
CO2	design programs using conditional statements and loops	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2

NATIONAL SERVICE SCHEME (NSS)/PHYSICAL EDUCATION/YOGAMANDATORY COURSE (NON-CRITIT)

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-MC-101	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO9	PO12
CO1	harness physical literacy and lifelong engagement	3	3	3	3	3
CO2	use aesthetic appreciation	2	1	2	3	3
CO3	build competence and confidence to face challenges	1	2	1	3	3
CO4	develop Sports related values and attitudes	3	3	2	2	3
CO5	follow appropriate etiquette and sports	1	1	2	3	3



ADVANCED CALCULUS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-102	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve linear and non-linear partial differential equations	3	2	1
CO3	evaluate the line, surface and volume integrals and convert them from one to another by using multiple integrals	3	2	1
CO4	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

ENGINEERING PHYSICS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-107	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	illustrate the interference and diffraction phenomena of light	3	2	1
CO2	compare various crystal systems and characterization techniques	3	2	1
CO3	examine the mechanism of various lasers and holography	3	2	1
CO4	demonstrate the propagation of light in optical fiber	3	2	1
CO5	analyze the properties of nanomaterials	3	2	1

ENGLISH FOR ENGINEERS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-HSMC-101	2	-	-	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in RAWLS skills	3	1
CO2	demonstrate the acquired language in written and spoken contexts	3	1
CO3	express, restate and respond appropriately by comprehending the given data	3	1



CO4	develop proficiency to succeed in academic activities, research and career	3	1
CO5	excel in professional and social etiquette	3	1

DATA STRUCTURES THROUGH C

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-105	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	classify different data structures to design efficient programs	3	3	2	2
CO2	identify appropriate sorting and searching techniques	3	2	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	explain various concepts of non-linear data structures	3	3	2	2
CO5	choose an appropriate hashing technique for a given problem	3	3	2	2

COMPUTER AIDED ENGINEERING GRAPHICS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-107	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2

ENGINEERING PHYSICS LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-104	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	demonstrate the electrical properties of a semiconductor	3
CO2	compare practical results with theoretical calculations in electrical circuits	3
CO3	demonstrate the properties of lasers and optical fibers	3
CO4	find the energy gap of a semiconductor and identify its band structure	3
CO5	examine electrical resonance in LCR circuits	3

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ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-HSMC-102	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	identify the nuances of the language through multimedia experience	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3
CO4	develop speaking and listening skills	3	3
CO5	appraise communication and correspond effectively	3	3

DATA STRUCTURES THROUGH C LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-106	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	implement various searching and sorting techniques	3
CO2	demonstrate basic operations of stack and queues using arrays and linked lists	3
CO3	apply stack data structure to solve various computing problems	3
CO4	demonstrate and apply different methods for traversing graphs	3
CO5	construct binary search tree	3

ENVIRONMENTAL SCIENCE

MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-MC-102	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2



ENGINEERING MECHANICS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-203	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	analyze the resultant of a system of forces using principles of mechanics	3	2	1
CO2	apply the conditions of static equilibrium to particles and rigid bodies	3	2	1
CO3	determine mechanical efficiency of simple lifting machines, centroid and centre of gravity of simple sections	3	2	1
CO4	compute the second moment of inertia of various laminas and bodies	3	2	1
CO5	solve the problems involving kinetics and virtual work of particles	3	2	1

MATERIALS ENGINEERING

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-204	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the concepts of structure of metals and constitution of alloys	3	2	1
CO2	construct and interpret equilibrium phase diagrams	3	2	1
CO3	analyze the material properties of ferrous and non-ferrous alloys	3	2	1
CO4	apply various heat treatment methods to steels	3	2	1
CO5	outline the properties, applications of ceramic and composite materials	3	2	1

THERMODYNAMICS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ME-PC-211	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO 2
CO1	explain various thermodynamic systems and processes	3	3	2	3
CO2	apply the basic laws of thermodynamics	3	3	2	3
CO3	evaluate the performance of energy conversion devices	3	3	2	3
CO4	find property values during process using mixture of gasses concepts	3	3	2	3
CO5	assess performance parameters of thermodynamic cycles	3	3	2	3



MANUFACTURING PROCESSES

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ME-PC-212	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO 2
CO1	explain concepts of various casting techniques	3	3	2	3
CO2	differentiate various welded joints	3	3	2	3
CO3	distinguish the process details of soldering, brazing and welding	3	3	3	3
CO4	illustrate various techniques of metal working	3	3	2	3
CO5	distinguish various extrusion and forging techniques	3	3	3	3

KINEMATICS OF MACHINERY

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ME-PC-213	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	illustrate concepts of kinematics and mechanisms of machines	3	3	2	2
CO2	evaluate velocity and acceleration of simple mechanisms	3	3	3	2
CO3	explain working principle of various straight line mechanisms	3	3	2	2
CO4	develop cam profiles based on follower motion	3	3	3	2
CO5	solve problems related to gears and gear trains	3	3	3	3

MATERIALS ENGINEERING LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-205	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5
CO1	interpret crystal structure and necessity of alloying	3	3	3
CO2	perform metallographic characterization of metals and metal alloys	3	3	3
CO3	plot the hardness variations of heat treated and non-heat treated steels	3	3	3
CO4	select materials for various engineering applications	3	3	3
CO5	apply the skills and modern techniques for latest materials	3	3	3



MANUFACTURING PROCESSES LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ME-PC-214	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PSO 2
CO1	perform the casting process in manufacturing of different types products	3	3	3
CO2	determine the properties of different types of moulding sands	3	3	3
CO3	illustrate different welding processes required for fabrication	3	3	3
CO4	test the various metal forming processes	3	3	3
CO5	make use of blow and injection moulding equipment	3	3	3

BUSINESS COMMUNICATION SKILLS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-HSMC-201	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3
CO3	make use of soft skills to become a professional team member	3	3
CO4	apply knowledge of decision making, leadership, motivation	3	3
CO5	exhibit confidence in facing the interview process	3	3

SOCIAL INNOVATION LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-205	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	illustrate social innovation	3
CO2	identify the problems	3
CO3	choose suitable design processes	3
CO4	develop a prototype using suitable platform	3
CO5	prepare a report using project management techniques and ethics	3



GENDER SENSITIZATION LAB
(MANDATORY COURSE- NON- CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-MC-201	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

NUMERICAL AND STATISTICAL METHODS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-202	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve transcendental, linear and non-linear system of equations	3	2	1
CO2	find the solutions using numerical integrals and ODE	3	2	1
CO3	differentiate among random variables involved in the probability models	3	2	1
CO4	test hypothesis for small and large samples along with significance level	3	2	1
CO5	fit correlation, regression coefficients and association of attributes	3	2	1

SOLID MECHANICS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-ME-PC-221	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO1 2	PSO 1
CO1	determine the stress and strain of various materials	3	3	2	2	3
CO2	sketch the shear force and bending moment diagrams for beams of various supports and loads	3	3	2	3	3
CO3	analyze flexural and shear stresses in a beam	3	3	3	2	3
CO4	evaluate principal stresses, strains and various theories of failure	3	3	3	3	3



CO5	determine stresses and deformations in shafts and thin cylinders	3	3	2	2	3
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FLUID MECHANICS & HYDRAULIC MACHINERY

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-MC-PC-222	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the concepts of fluid statics	3	3	2	2
CO2	describe the concepts of fluid kinematics and dynamics	3	3	3	3
CO3	analyze flow through different pipes and boundary layer theory	3	3	3	3
CO4	select suitable turbine for given heads	3	3	3	2
CO5	estimate performance parameters of hydraulic machines	3	3	3	3

DYNAMICS OF MACHINERY

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-ME-PC-223	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the concepts of Gyroscopes, static and dynamic force analysis	3	3	2	3
CO2	illustrate turning moment diagrams and design of fly wheels	3	3	2	3
CO3	outline the concepts of friction-clutches, brakes and dynamometers	3	3	2	3
CO4	analyze balancing of rotating masses and characteristics of governors	3	3	2	3
CO5	summarize free and forced vibrations	3	3	2	3

APPLIED THERMODYNAMICS-I

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-MC-PC-224	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO 2
CO1	explain functioning of various IC engines	2	2	2	3
CO2	illustrate combustion phenomena in IC Engines	3	2	3	3
CO3	evaluate the effect of various operating variables on engine performance	3	2	3	3
CO4	analyze operating principles of different types of compressors	3	2	2	3
CO5	determine the efficiency of axial flow compressors	3	2	2	3



SOLID MECHANICS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-ME-PC-225	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PSO 1
CO1	analyze stress-strain relationship for given material	2	3	3
CO2	assess the flexural strength for given member	2	3	3
CO3	determine shear modulus of shaft and stiffness of spring	2	3	3
CO4	find the hardness and compressive strength of given material	2	3	3
CO5	measure toughness using Charpy and Izod tests	2	3	3

FLUID MECHANICS & HYDRAULIC MACHINERY LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-ME-PC-226	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PSO 2
CO1	find co-efficient of discharge for the venturimeter and orifice meter	2	3	2
CO2	determine minor losses and friction factor for a given pipeline	2	3	2
CO3	verify Bernoulli's equation	2	3	2
CO4	calculate impact of force of Jet on different types of Vanes	2	3	2
CO5	analyze the performance of various turbines and pumps	2	3	2

KINEMATICS & DYNAMICS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-ME-PC-227	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PSO 1
CO1	estimate primary & secondary forces for dynamic balancing of rotary masses	3	3	3
CO2	analyse the response of different vibrating systems	3	3	3
CO3	test the performance of governors	3	3	3
CO4	determine the effect of gyroscope for different motions	3	3	3
CO5	analyze cam profile	3	3	3



APTITUDE AND CRITICAL THINKING SKILLS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-204	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	build proficiency in quantitative reasoning	3	3
CO2	improve critical thinking skills	3	3
CO3	enhance analytical skills	3	3
CO4	demonstrate quantitative aptitude concepts	3	3
CO5	adapt principles of quantitative aptitude to achieve qualitative results	3	3

INDIAN CULTURE AND CONSTITUTION

MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-MC-202	3	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	3
CO2	explain features of languages, religions and holy books	3	3
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	3

INSTRUMENTATION & CONTROL SYSTEMS

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ME-PC-311	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain dynamic performance characteristics and sources of error	3	2	2
CO2	use various displacement, temperature and pressure measuring instruments	3	2	2
CO3	choose various speed, flow, acceleration & vibration measuring instruments	3	3	2
CO4	select strain, humidity, force, torque and power measuring instruments	3	3	2
CO5	outline various control systems and position controller applications	3	3	2



MACHINE TOOLS & METROLOGY

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ME-PC-312	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO1 2	PSO 2
CO1	explain cutting tool geometry, types of lathes and chip formation	3	3	3	3	3
CO2	illustrate operations of drilling, and boring machines	3	3	2	3	3
CO3	make use of the operations of milling and grinding machines	3	3	2	3	3
CO4	analyze the limits and tolerances for engineering components	3	3	3	3	3
CO5	test surface roughness of part and tool alignment	3	3	3	3	3

DESIGN OF MACHINE ELEMENTS

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ME-PC-313	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PSO 1
CO1	design machine elements under static loads	3	3	2	3	3
CO2	design machine elements under cyclic loads	3	3	2	3	3
CO3	design different fasteners like riveted, welded and bolted joints	3	3	3	3	3
CO4	design bearings for specific applications	3	3	3	3	3
CO5	design shafts, couplings and gears for particular applications	3	3	3	3	3

APPLIED THERMODYNAMICS – II

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ME-PC-314	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO12	PSO 2
CO1	explain Rankine cycle, working of boilers and its accessories	3	3	3	3
CO2	estimate the performance of steam nozzles	3	3	3	3
CO3	evaluate the performance of steam turbines and reaction turbines	3	3	3	3
CO4	outline working principles of steam condensers	3	3	3	3
CO5	illustrate working principles of gas turbines	3	3	2	3



AUTOMOBILE ENGINEERING

(Professional Elective – I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ME-PE-311	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO12	PSO 2
CO1	explain various components of the automobile and its functions	3	3	3	3
CO2	outline the cooling and electrical systems in automobile	3	3	3	3
CO3	illustrate the transmission system and function of its elements	3	3	3	3
CO4	demonstrate the elements of braking and steering systems	3	3	3	3
CO5	summarize the emission control methods used in automobiles	3	3	3	3

INDUSTRIAL ENGINEERING

(Professional Elective – I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ME-PE-312	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO8	PO1 1	PO1 2
CO1	explain principles of industrial engineering and management	3	3	3	3	3
CO2	design various organizational structures	3	3	2	3	3
CO3	illustrate principles of operations management and line balancing	3	3	3	3	3
CO4	analyze the work study and establish limits using SQC	3	3	3	3	3
CO5	assess the methods of job evaluation and project management	3	3	3	3	3

ELECTRIC & HYBRID VEHICLES

(Professional Elective – I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ME-PE-313	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO1 2	PSO 2
CO1	describe about working principle of electric vehicles	3	3	2	2	3
CO2	explain working principles of motors used in electric	3	3	2	2	3



	vehicles					
CO3	illustrate electronic devices & sensorless control in electric vehicles	3	3	2	2	3
CO4	outline the functioning of various hybrid vehicles	3	3	2	2	3
CO5	demonstrate the design concepts of fuel cells	3	3	2	2	3

INSTRUMENTATION AND CONTROL SYSTEMS LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ME-PC-315	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5
CO1	calibrate the measuring devices	3	3	3
CO2	demonstrate pressure, displacement and vibration measuring devices	3	3	3
CO3	analyze the temperature measuring devices	3	3	3
CO4	determine the speed using photo and magnetic speed pickups	3	3	3
CO5	perform and calibrate rotameter for flow measurement	3	3	3

MECHANICAL DRAWING LAB USING CAD

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ME-PC-316	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO 4	PO5	PO6	PO1 0	PSO 1	PSO 2
CO1	apply conventional representation on machine elements	3	3	3	3	3	3
CO2	draw the given machine elements using CAD	3	3	3	3	3	3
CO3	draw the assembly of machine elements using CAD	3	3	3	3	3	3
CO4	read and interpret given drawing using CAD	3	3	3	3	3	3
CO5	draw detailed drawings of machine elements using CAD	3	3	3	3	3	3

APPLIED THERMODYNAMICS LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ME-PC-317	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO7	PSO 2
CO1	construct valve timing diagram and test the performance of IC engines	3	3	3	3
CO2	find engine frictional power by motoring, retardation and Morse	3	3	3	3



	tests				
CO3	determine volumetric efficiency of IC engines	3	3	3	3
CO4	estimate the efficiency of reciprocating air compressor	3	3	3	3
CO5	study on boilers and identify the parts of the engine by disassembly	3	3	3	3

MACHINE TOOLS AND METROLOGY LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ME-PC-318	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO6	PSO 2
CO1	perform various operations on lathe and drilling machines	3	3	3	3
CO2	develop simple features by using shaper, planer and milling machines	3	3	3	3
CO3	measure the bores by internal micrometers and dial bore indicators	3	3	3	3
CO4	determine the angle and taper using Bevel protractor and Sine bar	3	3	3	3
CO5	evaluate screw thread parameters	3	3	3	3

SUMMER INTERNSHIP

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ME-PR-311	-	-	-	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

CODING SKILLS

MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-MC-301	1	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO12
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CO1	solve real world problems using C & DS	3	3	3	3	3
CO2	solve real world problems using DBMS	3	3	3	3	3
CO3	solve real world problems using Python	3	3	3	3	3
CO4	solve real world problems using Java, HTML, JavaScript	3	3	3	3	3
CO5	solve real world problems using any one emerging technology	3	3	3	3	3

HEAT TRANSFER

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-ME-PC-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO1 2	PSO 2
CO1	compute one dimensional steady state conduction heat transfer	3	3	3	3	3
CO2	solve transient heat conduction problems for simple geometries	3	3	3	3	3
CO3	analyze forced and natural convective heat transfer	3	3	3	3	3
CO4	design heat exchangers using LMTD and NTU methods	3	3	3	3	3
CO5	explain the principles of radiation	3	3	3	3	3

CAD/CAM

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-ME-PC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO 1	PSO 2
CO1	outline hardware & software requirements for CAD/CAM systems	3	3	3	3	3
CO2	develop surface & solid models using mathematical representations	3	3	3	3	3
CO3	write programs for CNC to manufacture industrial components	3	3	3	3	3
CO4	design GT layouts and process planning using CAD/CAM systems	3	3	3	3	3
CO5	implement FMS and CAQC concepts in CIM environment	3	3	3	3	3

OPERATIONS RESEARCH

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-ME-PC-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO1	PSO
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					2	2
CO1	formulate and solve LPP using various methods	3	3	3	3	3
CO2	solve transportation and assignment problems	3	3	3	3	3
CO3	compute sequencing and inventory model problems	3	3	3	3	3
CO4	analyze waiting lines and replacement problems	3	3	3	3	3
CO5	evaluate game theory and dynamic programming problems	3	3	3	2	3

REFRIGERATION & AIR CONDITIONING

(Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-ME-PE-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO1 2	PSO 2
CO1	apply the concepts of refrigeration to various systems	3	3	2	3	3
CO2	analyze the performance of vapor compression systems	3	3	2	3	3
CO3	illustrate the components of refrigeration system	3	3	2	3	3
CO4	outline vapor absorption, steam jet refrigeration systems	3	3	2	3	3
CO5	determine cooling and heating loads in air conditioning systems	3	3	2	3	3

UNCONVENTIONAL MACHINING PROCESSES

(Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-ME-PE-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO1 2	PSO 2
CO1	explain modern machining processes and principles of USM	3	3	3	3	3
CO2	outline working principles of AJM, WJM and AWJM techniques	3	3	3	3	3
CO3	demonstrate working principles of EDM, EDG and EDW	3	3	3	3	3
CO4	illustrate working principles of EBM, LBM and PAM processes	3	3	3	3	3
CO5	adapt working principles of CM and ECM processes	3	3	3	3	3



FINITE ELEMENT ANALYSIS

(Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-ME-PE-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO1 2	PSO 1
CO1	explain the fundamentals of FEM	3	2	2	3	3
CO2	solve the linear equations of truss & beam elements using FEM	3	3	3	3	3
CO3	evaluate the load and displacements for 2-D problems	3	3	3	3	3
CO4	apply the FE method for heat transfer problems	3	3	3	3	3
CO5	demonstrate the dynamic analysis for various objects using FEM	3	3	2	3	3

DISASTER MANAGEMENT

(Open Elective - I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

ROBOTICS

(Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2



CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate sensors for robot	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

JAVA PROGRAMMING

(Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-324	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	create packages and interfaces	3	2	3	3	2
CO4	build efficient code using multithreading and exception handling	3	2	3	3	2
CO5	design real-time applications using applets	3	2	3	3	2

HEAT TRANSFER LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-ME-PC-324	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO6	PO7	PSO 2
CO1	find thermal conductivity of common metallic materials	3	3	3	3



CO2	calculate heat transfer rate between fluid and solid boundaries	3	3	3	3
CO3	evaluate the performance of heat exchangers	3	3	3	3
CO4	determine the emissivity and Stefan Boltzmann constant for radiation	3	3	3	3
CO5	estimate heat transfer coefficient in natural,forced convection	3	3	3	3

COMPUTER AIDED ENGINEERING LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-ME-PC-325	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PSO 2
CO1	visualize and prepare detailed 3D drawing of a given object	3	3	3	3
CO2	develop the 3D objects by using CAD software	3	3	3	3
CO3	analyze 2D and 3D trusses and Beams with boundary conditions	3	3	3	3
CO4	analyze plane stress & strain components with boundary conditions	3	3	3	3
CO5	perform thermal and dynamic analysis of structures	3	3	3	3

COMPUTER AIDED MANUFACTURING LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-ME-PC-326	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO10	PSO 1	PSO 2
CO1	develop NC programming for lathe and milling operations	3	3	3	3	3
CO2	develop components on CNC lathe	3	3	3	3	3
CO3	create manufactured-components on CNC milling machine	3	3	3	3	3
CO4	generate .stl files from the models	3	3	3	3	3
CO5	create components on 3D Printer	3	3	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-HSMC-301	1	-	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3



CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3

HUMAN VALUES AND PROFESSIONAL ETHICS

MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-MC-302	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO12
CO1	identify values and ethics and its relation to individual excellence	3	3	3	2
CO2	outline the ten commandments and try to apply in professional career	2	2	3	2
CO3	illustrate modern percepts of ethics, CSR and Corporate Governance	3	3	3	2
CO4	analyze the purpose of professional code of ethics and whistle blowing	3	3	3	2
CO5	practice student professional/technical societies/associations activities	3	3	3	3

BUSINESS ECONOMICS

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-HSMC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	outline the concepts of business management & economics	3	2
CO2	identify demand function to predict sales using linear regression	3	2
CO3	adapt production, price, market and cost analysis functions	3	2
CO4	estimate enterprise requirements under risky economic environment	2	3
CO5	assess the operational and financial performance of an enterprise	3	3

ARTIFICIAL INTELLIGENCE AND ROBOTICS

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-ME-PC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO 1
CO1	explain the concepts of artificial intelligence	3	3	3	3
CO2	illustrate various heuristic search techniques	3	3	3	3



CO3	relate AI techniques in industrial robotics	3	3	3	3
CO4	analyze the robot motion through direct kinematics	3	3	3	3
CO5	develop program to control industrial robots	3	3	3	3

ADVANCED IC ENGINES

(Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-ME-PE-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO7	PO1 2	PSO 2
CO1	outline about various SI Engines	3	3	2	3	3
CO2	demonstrate various issues related to the CI Engines	3	3	2	3	3
CO3	Illustrate Pollutant formation and control in IC Engines	3	3	2	3	3
CO4	make use of Alternate Fuels	3	3	2	3	3
CO5	apply latest trends in IC Engines	3	3	2	3	3

FLEXIBLE MANUFACTURING SYSTEMS

(Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-ME-PE-413	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO 2
CO1	explain the concepts of FMS	3	3	3	3
CO2	make use of automated material handling systems	3	3	3	3
CO3	perform engineering analysis of ASRS	3	3	3	3
CO4	identify bottlenecks in FMS operational issues	3	3	3	3
CO5	summarize the concepts of JIT and lean manufacturing	3	3	3	3

PRODUCTION PLANNING & CONTROL

(Professional Elective – II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-ME-PE-415	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO11	PO12	PSO
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						2
CO1	illustrate the functions of PPC	3	3	2	3	3
CO2	outline the principles and types of forecasting	3	3	2	3	3
CO3	differentiate various inventory control techniques	3	3	3	3	3
CO4	solve routing and scheduling problems	3	3	3	3	3
CO5	summarize dispatching process	3	3	3	3	3

RENEWABLE ENERGY SOURCES

(Professional Elective – IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-ME-PE-412	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO7	PO1 2	PSO 2
CO1	illustrate the principles of solar radiation	3	3	2	3	3
CO2	utilize the applications of solar energy system	3	3	2	3	3
CO3	make use of wind energy and bio mass for power production	3	3	2	3	3
CO4	extract power from geothermal and tidal energy sources	3	3	2	3	3
CO5	explain the various energy conversion systems	3	3	2	3	3

PLANT LAYOUT & MATERIAL HANDLING

(Professional Elective – IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-ME-PE-414	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO7	PO1 2	PSO 2
CO1	explain the concepts of various plant layouts	3	3	2	3	3
CO2	make use of heuristics in design of plant layout	3	3	2	3	3
CO3	illustrate various types of material handling systems	3	3	2	3	3
CO4	select appropriate material handling systems	3	3	2	3	3
CO5	apply ergonomics and minimize the material handling costs	3	3	2	3	3

DESIGN OF TRANSMISSION SYSTEMS

(Professional Elective – IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-ME-PE-416	3	-	-	3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO1	PSO
CO1	design belts, pulleys and chain drives	3	3	2	3	2
CO2	design spur gears, parallel axis helical gears	3	3	2	3	2
CO3	design bevel, worm and cross helical gears	3	3	2	3	2
CO4	construct the gear box according to the speed variation	3	3	2	3	2
CO5	illustrate design concepts of cams,brakes and clutches	3	3	2	3	2

GREEN BUILDING TECHNOLOGIES

(Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO7	PO12
CO1	explain the fundamentals of energy use and processes in building	3	2	2	2
CO2	identify indoor environmental requirement and its management	3	3	3	2
CO3	assess the impact of solar radiation on buildings	3	3	3	2
CO4	evaluate end-use energy utilization and requirements	3	3	2	2
CO5	adapt audit procedures for energy management	3	3	3	2

DRONES

(Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-412	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO	PO2	PO3	PO5	PO7	PO12
CO1	explain concepts of creative industries	1	3	3	3	3	3
CO2	outline the needs of creative industries	3	3	3	3	3	3
CO3	illustrate deployment and deadly abilities of drones	3	3	3	3	3	3
CO4	adapt price based data routing in dynamic IoT	3	3	3	3	3	3
CO5	make use of security in UAV/Drone communications	3	3	3	3	3	3



5G TECHNOLOGIES

(Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-413	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO 1	PO 2	PO 3	PO5	PO7	PO1 2	PSO 1
CO1	explain basic principles of 5G communication	3	3	2	2	3	3	3
CO2	identify the 5G new radio, core network, mobile networks	3	3	2	2	3	3	3
CO3	analyze the physical architecture of 5G and its challenges	3	3	2	2	3	3	3
CO4	design the modulation and multiple access technique for 5G	3	3	2	2	3	3	3
CO5	evaluate the various channels, layers and links used in 5G	3	3	2	2	3	3	3

DATABASE MANAGEMENT SYSTEMS

(Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-414	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2

ARTIFICIAL INTELLIGENCE AND ROBOTICS LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-ME-PC-412	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO 2
CO1	illustrate various search techniques	3	3	3
CO2	solve real-time problems using graph theory	3	3	3
CO3	estimate the accuracy and repeatability of the robot arm	3	3	3



CO4	develop programming for robot trajectory motion	3	3	3
CO5	experiment with robot arm for palletizing, pick and place	3	3	3

INDUSTRY ORIENTED MINI-PROJECT

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-ME-PR-411	-	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3

POWER PLANT ENGINEERING

(Professional Elective – V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-ME-PE-421	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO1 2	PSO 2
CO1	illustrate energy sources, steam power plants and combustion process	3	2	2	3	3
CO2	explain the working principles of diesel and gas-turbine power plants	3	2	2	3	3
CO3	demonstrate hydro electric power plant with various layouts	3	3	2	3	3
CO4	outline the concepts of nuclear power plants	3	3	2	3	3
CO5	determine optimum parameters for power plants	3	3	2	3	3

PRODUCT LIFE CYCLE MANAGEMENT

(Professional Elective – V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-ME-PE-423	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO 2	PO3	PO6	PO12	PSO 1	PSO 2



CO1	outline the product life cycle management	3	3	2	3	3	3
CO2	explain CPLM and DEPLM	3	3	2	3	3	3
CO3	illustrate the digital life cycle	3	3	2	3	3	3
CO4	make use of the PLM Environment	3	3	2	3	3	3
CO5	apply the components of PLM	3	3	2	3	3	3

TRIBOLOGY

(Professional Elective – V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-ME-PE-425	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO1	PSO
CO1	outline the various parameters related to tribology	3	3	2	3	1
CO2	demonstrate the hydrostatic lubrication	3	3	2	3	3
CO3	illustrate the various theories of lubrication	3	3	2	3	3
CO4	make use of the power losses in bearings	3	3	2	3	3
CO5	apply the concepts of lubrication of bearings	3	3	2	3	3

COMPUTATIONAL FLUID DYNAMICS

(Professional Elective – VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-ME-PE-422	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO
CO1	distinguish various numerical methods used in CFD	3	3	3	2
CO2	explain the basic rules of FVM	3	3	3	3
CO3	apply FVM to solve convection and diffusion problems	3	3	3	3
CO4	solve flow field problems using CFD	3	3	3	3
CO5	analyze turbulent flows by applying CFD concepts	3	3	3	3

OPTIMIZATION TECHNIQUES

(Professional Elective – VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-ME-PC-424	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO 2
CO1	explain the classical optimization techniques	3	3	3	3
CO2	determine solution for linear problems using optimization techniques	3	3	3	3
CO3	solve unconstrained non linear problems using various methods	3	3	3	3
CO4	provide solution for constrained non linear problems using various methods	3	3	3	3
CO5	find solution for multivariable problems using dynamic programming	3	3	3	3

ADDITIVE MANUFACTURING

(Professional Elective – VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-ME-PE-426	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO 1	PSO 2
CO1	explain the concepts of additive manufacturing	3	3	3	3	3
CO2	differentiate liquid and solid based rapid prototyping systems	3	3	3	3	3
CO3	illustrate powder based rapid prototyping and tooling systems	3	3	3	3	3
CO4	apply various data file formats in 3D printing	3	3	3	3	3
CO5	summarize various rapid prototyping applications	3	3	3	3	3

INTELLECTUAL PROPERTY RIGHTS

(Open Elective-III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-421	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO8	PO12
CO1	outline basics of intellectual property law	3	3	3	3
CO2	identify the various trademarks	3	3	3	3
CO3	analyze patent and copy rights law	3	3	3	3
CO4	differentiate trade secret and unfair practice	3	2	3	2
CO5	summarize new developments in Intellectual Property Rights	3	3	3	3



PRINCIPLES OF ENTREPRENEURSHIP

(Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-422	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3

PRECISION AGRICULTURE

(Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-423	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO 2
CO1	explain the concepts of precision agriculture	3	3	3	3	3	3
CO2	outline the components of precision agriculture	3	3	3	3	3	3
CO3	illustrate about tools technologies and sampling	3	3	3	3	3	3
CO4	adapt recent advances in precision agriculture	3	3	3	3	3	3
CO5	make use of feasibility and evaluation of precision farming	3	3	3	3	3	3

WEB TECHNOLOGIES

(Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-424	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO1 2
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3



CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2

MAJOR PROJECT

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-ME-PR-421	-	-	20	10

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3

Academic Regulations (R17)
B.Tech. - Regular Four Year Degree Programme (ECE)
(For batches admitted from the academic year 2017 - 18)
Department of Electronics and Communication Engineering

ENGINEERING MATHEMATICS – I
(Differential Equations & Matrix Algebra)

I -B.Tech.-I-Sem

Subject Code: 17EC1101BS

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve system of linear equations by using matrices	3	2	1
CO3	find Eigen values and Eigen vectors	3	2	1
CO4	find the extreme values of functions of several variables and evaluation of improper integrals by using Beta and Gamma functions	3	2	1
CO5	evaluate multiple integrals and find the line, surface and volume integrals and convert them by using multiple integrals	3	2	1

PROFESSIONAL COMMUNICATION IN ENGLISH

I-B.Tech.-I-Sem.

Subject Code: 17EC1102HS

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	apply appropriate vocabulary and grammar	3	1
CO2	use effective writing skills in formal and informal situations	3	1
CO3	demonstrate reading skills to pursue research and academic activities	3	1
CO4	apply and exhibit professional and social Etiquette	3	1
CO5	employ reference and study skills for lifelong learning	3	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

I-B.Tech.-I-Sem.

Subject Code: 17EC1103ES

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws and explain single phase AC circuits	3	3	2	1
CO2	solve electrical circuits using network theorems and illustrate diode characteristic	3	3	2	1
CO3	identify special purpose devices and use diode circuits for various applications	3	3	2	1
CO4	illustrate the configurations and biasing techniques of Bi-polar junction transistor	3	3	2	1
CO5	characterize JFET	3	3	2	1

ENGINEERING GRAPHICS

I-B.Tech.-I-Sem.

Subject Code: 17EC1104ES

L T P C

2 0 3 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



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COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2

COMPUTER PROGRAMMING

I-B.Tech.-I-Sem

Subject Code: 17EC1105ES

L T P C

3 1 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

I-B.Tech.-I-Sem.

Subject Code: 17EC1106HS

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	apply the sounds of English for proper pronunciation	3	3
CO2	use the right accent and intonation in formal and informal situations	3	3
CO3	distinguish and neutralize various accents for intelligibility	3	3
CO4	develop speaking and listening skills through audio-visual experiences	3	3
CO5	demonstrate employability skills through various activities	3	3

COMPUTER PROGRAMMING IN C LAB

I-B.Tech.-I-Sem

Subject Code: 17EC1107ES

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3
CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

I-B.Tech.-I-Sem.

Subject Code:17EC1108ES

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws and network theorems	3
CO2	verify the V-I characteristics of various electronic devices	3
CO3	determine the efficiency of various rectifiers	3
CO4	illustrate the configurations of Bi-polar junction transistor	3
CO5	demonstrate the characteristics of FET and SCR	3



**NATIONAL SERVICE SCHEME (NSS) / PHYSICAL EDUCATION / YOGA
MANDATORY COURSE (NON-CREDIT)**

I-B.Tech.-I-Sem.
Subject Code: 17AC1109MC

L T P C
0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO9	PO12
CO1	harness physical literacy and lifelong engagement	3	3	3	3	3
CO2	use aesthetic appreciation	2	1	2	3	3
CO3	build competence and confidence to face challenges	1	2	1	3	3
CO4	develop Sports related values and attitudes	3	3	2	2	3
CO5	follow appropriate etiquette and sports	1	1	2	3	3

**ENGINEERING MATHEMATICS – II
(Vector Calculus, Fourier Analysis & PDE)**

I-B.Tech.-II-Sem.
Subject Code: 17EC1201BS

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve ODE by using Laplace transforms	3	2	1
CO2	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO3	solve the line, surface and volume integrals by using vector integration	3	2	1
CO4	find periodic functions in terms of Fourier series and non-periodic functions of Fourier transform	3	2	1
CO5	formulate Partial Differential Equation, solve Linear and non-linear Differential Equations and analyze one dimensional heat and wave equation	3	2	1

APPLIED PHYSICS

I-B.Tech.-II-Sem
Subject Code:17EC1202BS

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	analyze the crystal structures and X-ray diffraction techniques	3	2	1
CO2	explain the particle behavior in solids using quantum mechanics and band theory of solids	3	2	1
CO3	outline Dielectric and magnetic properties of materials and their applications	3	2	1
CO4	illustrate principles and applications of lasers and optical fibers	3	2	1
CO5	classify semiconductors & Nano-materials and illustrate functioning of various semiconductor devices	3	2	1

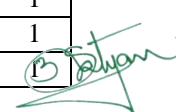
ENGINEERING CHEMISTRY

I-B.Tech.-II-Sem
Subject Code:17EC1203BS

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	identify the properties of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	make use of polymers in domestic and industrial fields	3	2	1
CO4	analyze the quality of fuels used in automobiles, industry and aerospace	3	2	1



CO5	illustrate the properties of various engineering materials	3	2	1
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ELECTRIC CIRCUITS & MACHINES

I-B.Tech.-II-Sem.

Subject Code: 17EC1204ES

L T P C

3 1 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	design resonant circuits, network topology and magnetic circuits	3	3	1
CO2	explain the transient response of RLC circuits	3	2	1
CO3	illustrate the two port network parameters and characteristics of filters & attenuators	3	3	1
CO4	analyze the performance of DC generators and DC motors	3	2	1
CO5	evaluate the performance of single phase transformer	3	2	1

DATA STRUCTURES THROUGH C

I-B.Tech.-II-Sem.

Subject Code: 17EC1205ES

L T P C

3 1 - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	classify different data structures to design efficient programs	3	3	2	2
CO2	identify appropriate sorting and searching techniques	3	2	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	explain various concepts of non-linear data structures	3	3	2	2
CO5	choose an appropriate hashing technique for a given problem	3	3	2	2

APPLIED PHYSICS / ENGINEERING CHEMISTRY LAB

I -B.Tech.-II-Sem

Subject Code: 17EC1206BS

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	identify modulus of elastic materials , determine the characteristics & applications of LED and SOLAR CELL, find the energy gap of a semiconductor and analyze the wavelength of laser source	3
CO2	demonstrate the resonance of LCR circuit, determine Time Constant of RC circuit & find variation of the magnetic field and determine losses in optical fiber	3
CO3	determine the hardness, viscosity and pH of various samples	3
CO4	synthesize the drug used in pharmaceutical industry	3
CO5	estimate the strength of solutions and amount of coloured solutions	3

DATA STRUCTURES THROUGH C LAB

I-B.Tech.-II-Sem.

Subject Code: 17EC1207ES

L T P C

- - 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	implement various searching and sorting techniques	3
CO2	demonstrate basic operations of stack and queues using arrays and linked lists	3
CO3	apply stack data structure to solve various computing problems	3
CO4	demonstrate and apply different methods for traversing graphs	3
CO5	construct binary search tree	3



IT & ENGINEERING WORKSHOP

I-B.Tech.-II-Sem.
Subject Code: 17EC1208ES

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	install and make use of operating systems and MS office tools	3	3	2	2
CO2	configure fire walls and trouble shoot network connections	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2

MICRO PROJECT (MANDATORY NON-CREDIT COURSE)

I-B.Tech.-II-Sem.
Subject Code: 17AC1209MC

L T P C
0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	select problem and evaluate	3
CO2	review the literature related to the problem	3
CO3	implement principles of science and Engineering	3
CO4	analyze the problem	3
CO5	present the essence of project work	3

COMPLEX ANALYSIS AND NUMERICAL METHODS

II-B.Tech.-I-Sem.
Subject Code: 17EC2101BS

L T P C
4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	analyze the complex functions with reference to their analyticity	3	2	1
CO2	expand complex functions using Taylor's, Laurent's and Residue theorems	3	2	1
CO3	evaluate improper integrals and bilinear transformation by using complex variables	3	2	1
CO4	solve transcendental, linear and non-linear system of equations using numerical methods	3	2	1
CO5	find the numerical solutions for first order initial value problems and integrals	3	2	1

PROBABILITY THEORY & STOCHASTIC PROCESSES

II-B.Tech.-I-Sem.
Subject Code: 17EC2102BS

L T P C
4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	apply the concepts of probability and random variables	3	3	2	3
CO2	evaluate the distribution and density functions of single random variables	3	3	2	3
CO3	solve the problems related to multiple random variables	3	3	2	3
CO4	analyze the stochastic process and its temporal characteristics	3	3	2	3
CO5	outline the spectral characteristics of stochastic process	3	3	2	3

ANALOG ELECTRONICS

II-B.Tech.-I-Sem.
Subject Code: 17EC2103PC

L T P C
4 0 0 4



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO13
CO1	analyze single stage amplifiers at low frequencies	3	3	2	2	3
CO2	design multistage amplifiers at high frequencies using transistors	3	3	2	2	3
CO3	illustrate feedback amplifiers and oscillators	3	3	2	2	3
CO4	examine the power and tuned amplifiers	3	3	2	2	3
CO5	interpret various FET Amplifiers	3	3	2	2	3

SIGNALS AND SYSTEMS**II-B.Tech.-I-Sem.****Subject Code: 17EC2104PC****L T P C****3 1 0 3****Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)**

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	interpret various types of signals and systems	3	3	2	3
CO2	analyze the signals in frequency domain using Fourier Transform and Sampling	3	3	2	3
CO3	apply the mathematical modelling to LTI systems for processing signals	3	3	3	3
CO4	determine the convolution and correlation on various signals	3	3	2	3
CO5	evaluate the response of the systems using Laplace and Z-transforms	3	3	3	3

SWITCHING THEORY AND LOGIC DESIGN**II-B.Tech.-I-Sem.****Subject Code: 17EC2105PC****L T P C****3 0 0 3****Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)**

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO13
CO1	interpret number systems and boolean algebra	3	3	2	2	3
CO2	solve boolean expressions and analyze combinational circuits	3	3	3	3	3
CO3	construct small combinational circuits & sequential logic circuits	3	3	3	3	3
CO4	design sequential circuits for registers and counter	3	3	3	3	3
CO5	differentiate mela and moore models and to minimize completely and incompletely specified sequential machines	3	3	3	3	3

ANALOG ELECTRONICS LAB**II-B.Tech.-I-Sem.****Subject Code: 17EC2106PC****L T P C****0 0 3 2****Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)**

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	design and analyze the transistor amplifier circuits	3	3	3
CO2	design and analyze the FET amplifiers	3	3	3
CO3	Design and analyze the feedback amplifiers	3	3	3
CO4	Design and analyze the Oscillators	3	3	3
CO5	Design and analyze the large signal amplifiers	3	3	3

BASIC SIMULATION LAB**II-B.Tech.-I-Sem.****Subject Code: 17EC2107PC****L T P C****0 0 3 2****Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)**

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 Hyderabad-501 401.

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	interpret various types of MATLAB tools	3	3	3
CO2	solve different signals and perform different operations on signals	3	3	3
CO3	analyze convolution, correlation between signals and sequences	3	3	3
CO4	examine the stability of the system using S-plane and Z-plane	3	3	3
CO5	identify signals in the presence of noise and find energy and power spectral density	3	3	3

ELECTRIC CIRCUITS & MACHINES LAB

II-B.Tech.-I-Sem.

Subject Code: 17EC2108ES

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	design the two port network parameters	3	3	3
CO2	evaluate the different resonance circuits	3	3	3
CO3	analyze of different testing methods & speed control of DC machines	3	3	3
CO4	examine different testing methods of AC machines	3	3	3
CO5	outline the characteristics & efficiency of transformer	3	3	3

ENVIRONMENTAL SCIENCE AND TECHNOLOGY MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-I-Sem.

Subject Code: 17HS2109MC

L T P C

3 0 0 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2

ANALYTICAL SKILLS MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-I-Sem.

Subject Code:17BS2110MC

L T P C

0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	apply operations like searching, insertion, deletion, traversing mechanism etc. on various data structures	3	3
CO2	apply measurement techniques to data collection and utilize their innovative thinking skills to project themselves for finding fresh approaches towards tribulations	3	3
CO3	use the skills for effective communication	3	3
CO4	identify different types of arguments as well as their premises and conclusions	3	3
CO5	demonstrate the mathematical reasoning, including the ability to prove simple results and/or make statistical inferences	3	3

PULSE & DIGITAL CIRCUITS

II-B.Tech.-II-Sem.

L T P C



Subject Code: 17EC2201PC

3 1 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	design of linear wave shaping circuits for various applications	3	3	2	3
CO2	construct nonlinear wave shaping circuits	3	3	2	3
CO3	demonstrate the switching characteristics of diode and transistor	3	3	2	3
CO4	design and analyze multi-vibrator circuits and time-base generators	3	3	2	3
CO5	develop circuits using the concepts of sampling gates and logic families	3	3	2	3

ANALOG COMMUNICATIONS

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17EC2202PC

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO13
CO1	explain various amplitude modulation techniques	3	3	2	2	3
CO2	distinguish SSB and VSB Modulations	3	3	2	2	3
CO3	outline the angle modulation and demodulation schemes	3	3	2	2	3
CO4	identify various noise sources and their effects on analog modulation techniques	3	3	3	2	3
CO5	design AM and FM receivers and also acquire knowledge of generation and demodulation of PAM, PWM, PPM	3	3	3	2	3

ELECTRO MAGNETIC THEORY & TRANSMISSION LINES

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17EC2203PC

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	illustrate the concepts of electric fields	3	2	2	3
CO2	outline the characteristics of electromagnetic fields using Maxwell's equations	3	2	2	3
CO3	explain EM wave characteristics	3	3	2	3
CO4	summarize the fundamental concepts of transmission line theory	3	3	2	3
CO5	analyze transmission lines using smith chart or classical theory	3	3	2	3

DIGITAL DESIGN THROUGH VERILOG HDL

II-B.Tech.-II-Sem.

L T P C

Subject Code: 17EC2204PC

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	explain the basic concept of verilog hardware description languages (HDL)	3	2	2	3
CO2	outline the gate and switch level models of digital circuits	3	3	3	3
CO3	make use of behavioral level of digital circuits	3	3	3	3
CO4	design combinational circuits	3	2	2	3
CO5	construct sequential circuits	3	2	2	3

FINANCIAL ANALYSIS, MANAGEMENT & ECONOMICS



II-B.Tech.-II-Sem.
Subject Code: 17EC2205HS

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	analyze financial performance of an enterprise using final accounts and ratio	3	2
CO2	apply principles of management in professional career	3	2
CO3	make use of principles of economics for decision making	3	2
CO4	identify business environment and laws of demand	2	3
CO5	solve problems in the areas of production, cost, price and markets	3	3

ULSE & DIGITAL CIRCUITS LAB

II-B.Tech.-II-Sem.
Subject Code: 17EC2206PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	design linear and non linear wave shaping circuits	3	3	3
CO2	analyze multivibrators and its applications	3	3	3
CO3	create oscillations and sweep signals using UJT and Boot strap circuits	3	3	3
CO4	illustrate the switching characteristics of transistor	3	3	3
CO5	demonstrate the operation of logic gates and sampling gates	3	3	3

ANALOG COMMUNICATIONS LAB

II-B.Tech.-II-Sem.
Subject Code: 17EC2207PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	design Amplitude Modulation and Demodulation circuits	3	3	3
CO2	analyze Frequency Modulation and Demodulation circuits	3	3	3
CO3	construct AM and FM signals using Spectrum analyzer	3	3	3
CO4	illustrate the Communication system using Multiplexing techniques	3	3	3
CO5	demonstrate the operation of Pulse Modulation and Demodulation circuit	3	3	3

DIGITAL DESIGN THROUGH VERILOG HDL LAB

II-B.Tech.-II-Sem.
Subject Code: 17EC2208PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	examine basic logic gates	3	3	3
CO2	implement boolean functions using universal gates	3	3	3
CO3	construct various combinational logic circuits	3	3	3
CO4	analyze the operation of flip-flops	3	3	3
CO5	design registers and counters using flip-flops	3	3	3

GENDER SENSITIZATION LAB
MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-II-Sem.
Subject Code: 17HS2209MC

L T P C
0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

VERBAL ABILITY MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-II-Sem.

Subject Code: 17HS2210MC

L T P C
0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	recall grammatical and basic sentence structures for communication	3	3
CO2	list out various vocabulary forms and improve verbal ability	3	3
CO3	use sentence structures without errors	3	3
CO4	apply the sentence structure for effective paraphrasing	3	3
CO5	demonstrate effective verbal skills	3	3

LINEAR AND DIGITAL IC APPLICATIONS

III-B.Tech.-I-Sem.

Subject Code: 17EC3101PC

L T P C
4 - - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	describe various stages of operational amplifier	3	2	2	3
CO2	design active filters, PLL and 555 timers	3	3	2	3
CO3	analyze various ADCs and DACs	3	3	2	3
CO4	construct various combinational circuits using IC's	3	3	2	3
CO5	build various sequential circuits using IC's	3	3	2	3

DIGITAL COMMUNICATIONS

III-B.Tech.-I-Sem.

Subject Code: 17EC3102PC

L T P C
4 - - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PO13
CO1	explain various elements of communication systems & pulse code modulation	3	3	2	2	3
CO2	analyze digital modulation techniques & data transmission	3	3	3	2	3
CO3	discuss information theory	3	3	3	2	3
CO4	illustrate different error control codes	3	3	2	2	3
CO5	demonstrate spread spectrum modulation	3	3	2	2	3

CONTROL SYSTEMS

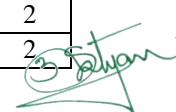
III-B.Tech.-I-Sem.

Subject code 17EC3103PC

L T P C
3 1 - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain mathematical models of control systems in continuous time	3	3	2
CO2	determine the transient and steady state performances of a control system	3	3	2



CO3	analyze the stability by using R-H criterion and root-locus concepts	3	3	2
CO4	evaluate the stability analysis in frequency domain	3	3	2
CO5	examine the controllability and observability of a system	3	3	2

ANTENNA AND WAVE PROPAGATION

III-B.Tech.-I-Sem.

Subject Code: 17EC3104PC

L T P C

4 - - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	explain the radiation of electromagnetic waves from antennas	3	3	2	3
CO2	explain the Characteristics antennas at VHF and UHF	3	3	2	3
CO3	design antennas at VHF and UHF	3	3	3	3
CO4	analyze antenna arrays and measure antenna parameters	3	3	3	3
CO5	identify the characteristics and effects on Radio Wave Propagation	3	3	2	3

DISASTER MANAGEMENT

(Open Elective-I)

III-B.Tech.-I-Sem.

Subject Code: 17CE3105OE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

OPERATIONS RESEARCH

(Open Elective-I)

III-B.Tech.-I-Sem.

Subject Code: 17ME3105OE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	formulate and solve linear programming problem using various methods	3	2	3
CO2	solve transportation and assignment problems	3	3	3
CO3	compute sequencing and inventory model problems	2	2	2
CO4	analyze waiting lines and game theory problems by applying standard solution methods	3	3	3
CO5	evaluate replacement and dynamic programming problems by applying various methods	2	3	3

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Open Elective-I)

III B.Tech. I-Sem

Subject Code: 17EC3105OE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



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COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

JAVA PROGRAMMING

(Open Elective-I)

III-B.Tech.-I-Sem.

Subject Code: 17CS3105OE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	build efficient code using multithreading and exception handling	3	2	3	3	2
CO4	illustrate event handling mechanism	3	2	3	3	2
CO5	make use if applets and swing concepts	3	2	3	3	2

LINEAR & DIGITAL IC APPLICATIONS LAB

III B.Tech.I Sem.

SubjectCode: 17EC3106PC

L T P C

- - 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	construct circuits for various applications using Op-Amp IC741	3	3	3
CO2	design various applications with specific ICs	3	3	3
CO3	model various sequential and combinational circuits using digital ICs	3	3	3
CO4	design and analyze synchronous and asynchronous counters using digital ICs	3	3	3
CO5	implement the sequential circuits	3	3	3

DIGITAL COMMUNICATIONS LAB

III B.Tech.I Sem.

Subject Code: 17EC3107PC

L T P C

- - 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	compare PCM, DPCM and DM	3	3	3
CO2	test FSK, PSK, DPSK & QPSK	3	3	3
CO3	demonstrate time division multiplexing & Amplitude Shift Keying	3	3	3
CO4	determine spectral characteristics of PAM & QAM	3	3	3
CO5	design OFDM	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS (AECS) LAB

IIIB.Tech ISem.

Subject Code: 17EC3108HS

L T P C

- - 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3



CO3	elaborate academic reading and writing skills	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3

HUMAN VALUES AND PROFESSIONAL ETHICS

MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-I-Sem.

Subject Code: 17HS3109MC

L T P C

3 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO12
CO1	apply the importance of human values for personal and societal development	3	3	3	2
CO2	develop ethics and professional attitude	2	2	3	2
CO3	explain ethical standards in a professional environment	3	3	3	2
CO4	distinguish between professional rights and employee rights	3	3	3	2
CO5	identify their role in professional spheres	3	3	3	3

QUANTITATIVE APTITUDE

MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-I-Sem.

Subject Code: 17BS3110MC

L T P C

- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	Recall the basics of number systems and apply them accordingly	3	3
CO2	Apply the concepts of percentages, profit and loss, & Interests in real life situations	3	3
CO3	demonstrate various principles related to Distance ,speed ,time and work in solving mathematical problems	3	3
CO4	distinguish between permutations and combinations ,clocks and calendars for solving problems	3	3
CO5	apply principles of geometry and mensuration to achieve qualitative results at workplace	3	3

MICROPROCESSORS AND MICROCONTROLLERS

III-B.Tech.-II-Sem.

Subject Code:17EC3201PC

L T P C

4 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PO13
CO1	illustrate the internal architecture and organization of 8086	3	3	2	2	3
CO2	analyze 8086 ALPs and interfacing devices	3	3	2	2	3
CO3	explain the architecture of 8051 microcontroller	3	3	2	3	3
CO4	interface memory, I/O and advanced peripherals with 8051	3	3	2	3	3
CO5	adapt the architecture and instruction set of ARM processor	3	3	2	3	3

DIGITAL SIGNAL PROCESSING

III B.Tech. II-Sem

Subject Code: 17EC3202PC

L T P C

4 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13



CO1	analyze discrete times signals in the time and frequency domains	3	3	2	3	3
CO2	implement DFT and FFT on time domain signals	3	3	2	3	3
CO3	design IIR filters using various techniques	3	3	2	3	3
CO4	design FIR filters using various techniques	3	3	2	3	3
CO5	illustrate Multirate Signal Processing	3	3	2	2	3

MICROWAVE ENGINEERING

III B.Tech. II Sem

Subject code: 17EC3203PC

L T P C

4 - - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	identify the need of microwaves and transmission line characteristics	3	2	2	3
CO2	analyze electromagnetic wave propagation and microwave components	3	3	2	3
CO3	explain the operation of various microwave tubes	3	2	2	3
CO4	determine measurement parameters using microwave equipments	3	3	2	3
CO5	develop microwave systems for various applications	3	3	2	3

GLOBAL WARMING & CLIMATE CHANGE

(Open Elective – II)

III-B.Tech.-II-Sem.

Subject Code: 17CE3204OE

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO7	PO8	PO12
CO1	describe the various consequences of climate change	3	3	3	3	2
CO2	illustrate the methods of measurement of climate change	3	3	3	3	2
CO3	analyze the causes for climate change and its impacts	3	3	3	3	2
CO4	evaluate the impact of global warming and climate change	3	3	3	3	2
CO5	explain various mitigation techniques	3	3	3	3	2

FUNDAMENTALS OF ROBOTICS

(Open Elective – II)

III-B.Tech-II-Sem

Subject Code: 17ME3204OE

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2
CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate sensors for robot	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

PRINCIPLES OF COMMUNICATION SYSTEMS

(Open Elective – II)

III -B.Tech.-II-Sem


Subject Code: 17EC3204OE

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the fundamentals of communication systems	3	2	2	2
CO2	analyze various analog modulation and demodulation schemes	3	3	3	2



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CO3	explain sampling theorem, pulse modulation and multiplexing techniques	3	3	3	2
CO4	illustrate digital modulation schemes	3	3	2	2
CO5	develop source and channel coding techniques	3	3	3	2

DATABASE MANAGEMENT SYSTEMS
(Open Elective – II)

III-B.Tech- II Sem

Subject Code: 17CS3204OE

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2

COMPUTER ORGANIZATION & OPERATING SYSTEMS
(Professional Elective –I)

III B.Tech II SEM

Subject Code: 17EC3205PE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	outline the fundamentals of basic structure of computer	3	2	2	3
CO2	explain the concept micro programmed control	3	2	3	3
CO3	make use of input-output organization	3	3	3	3
CO4	distinguish various memories and pipelining operations	3	3	3	3
CO5	explore various concepts of operatingsystems	3	3	3	3

DATA COMMUNICATIONS
(Professional Elective – I)

III-B.Tech.-II-Sem

Subject Code: 17EC3206PE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	explain the basic concept of data communications and networking	3	2	2	3
CO2	distinguish metallic cable transmission media & optical fiber transmission media	3	3	2	3
CO3	explore digital transmission ,multiplexing and T carriers & wireless communications systems	3	3	2	3
CO4	outline the telephone instruments and signals & cellular telephone systems	3	2	2	3
CO5	make use of data communications codes, error control, and data formats & data communications equipment	3	3	2	3

ADVANCED DIGITAL DESIGN
(Professional Elective –I)

III-B.Tech.-II-Sem

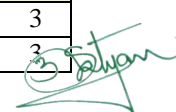
Subject Code: 17EC3207PE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO13
CO1	illustrate tabular & computer aided minimization procedures	3	2	2	3	3
CO2	explore algorithmic state machines	3	3	2	3	3



CO3	make use of fault diagnosis and tolerance	3	3	3	3	3
CO4	outline the fundamental of VHDL	3	2	3	3	3
CO5	write vhdl code for logic circuits	3	3	3	3	3

TELECOMMUNICATION SWITCHING SYSTEMS AND NETWORKS

(Professional Elective –I)

III-B.Tech.-II-Sem

Subject Code: 17EC3208PE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	explain the basic concept of switching systems	2	2	2	2	3
CO2	make use of switching networks	3	3	3	2	3
CO3	explore signaling	3	3	2	3	3
CO4	analyze packet switching	3	3	3	3	3
CO5	outline the networks	3	2	2	2	3

MICROPROCESSORS AND MICROCONTROLLERS LAB

III B.Tech. II Sem.

Course Code: 17EC3209PC

L T P C

- - 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	interpret programs for various problems using 8086 microprocessor	3	3	3
CO2	develop interfacing between 8086 microprocessor and various peripherals	3	3	3
CO3	compile programs on Microcontroller based systems	3	3	3
CO4	interface 8051 ports with various peripherals	3	3	3
CO5	design Microprocessor and Microcontroller based systems	3	3	3

DIGITAL SIGNAL PROCESSING LAB

III B.Tech.- II Sem

Course Code: 17EC3210PC

L T P C

- - 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	classify various types of signals and perform linear operations on the signals	3	3	3
CO2	compute linear and circular convolution	3	3	3
CO3	analyze the principles of DIT FFT and DIF FFT algorithms	3	3	3
CO4	design digital IIR and FIR filter using various techniques	3	3	3
CO5	apply Multirate concepts in sampling rate conversion applications	3	3	3

MICROWAVE ENGINEERING LAB

III B.Tech. II Sem

Subject code: 17EC3211PC

L T P C

- - 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	interpret the characteristics of microwave devices	3	3	3
CO2	determine scattering parameters of various microwave components	3	3	3
CO3	analyze various parameters of waveguide components	3	3	3
CO4	measure VSWR and antenna pattern	3	3	3
CO5	design a microwave communication link using microwave bench	3	3	3

SOFT SKILLS

Mandatory Course (Non Credit)



III B.Tech. II Sem
Course Code: 17HS3212MC

L T P C
- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	identify the need for self awareness and exhibit professional attitude	3	3
CO2	interpret and improve in personal and professional communication	3	3
CO3	develop leadership skills and enhance the employability	3	3
CO4	recognize the importance of decision making and change management to improve professional attributes	3	3
CO5	apply interview techniques for overall development	3	3

CELLULAR AND MOBILE COMMUNICATIONS

IVB.Tech.I Sem
Subject code: 17EC4101PC

L T P C
4 - - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	demonstrate the performance criteria of cellular systems	3	2	2	3	3
CO2	identify various types of interference and frequency planning	3	2	2	3	3
CO3	illustrate cell coverage, cell site and mobile antennas	3	2	2	3	3
CO4	summarize frequency management and channel assignment	3	2	2	3	3
CO5	classify various multiple access and spread spectrum techniques	3	2	2	3	3

VLSI DESIGN

IV-B. Tech.-I-Sem.
Subject Code: 17EC4102PC

L T P C
4 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PO13
CO1	interpret various MOS transistor fabrication techniques	3	2	3	3	3
CO2	illustrate operation and electrical characteristics of MOS transistor	3	2	2	3	3
CO3	discuss VLSI Design flow, Stick diagrams, layout, design rules	3	3	2	3	3
CO4	outline the concepts of MOS circuits	3	3	2	3	3
CO5	interpret scaling and various levels of CMOS testing	3	3	2	3	3

SATELLITE COMMUNICATIONS

IV -B.Tech.-I-Sem
Subject Code: 17EC4103PC

L T P C
4 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	summarize orbital effects on satellite communications	3	2	3	2	3
CO2	interpret the subsystems of satellite	3	3	3	3	3
CO3	classify various multiple access and spread spectrum techniques	3	3	2	2	3
CO4	compare satellite subsystems with earth station technology	3	3	3	2	3
CO5	outline the satellite navigation and global positioning system	3	3	3	3	3

**ENVIRONMENTAL IMPACT ASSESSMENT
(Open Elective – III)**

IV-B.Tech.-I-Sem.
Subject Code: 17CE4104OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO6	PO7	PO10	PO12
CO1	identify the attributes to be considered for EIA	3	3	3	3
CO2	assess impact of deforestation	3	3	3	3
CO3	interpret impact prediction, significance of soil quality and mitigation	3	3	2	3
CO4	conduct environmental audit and prepare reports	3	3	2	3
CO5	illustrate environmental policies and provisions	3	3	3	3

PRINCIPLES OF ENTREPRENEURSHIP (Open Elective – III)

IV-B.Tech. I-Sem.

Subject Code: 17ME4104OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3

PRINCIPLES OF EMBEDDED SYSTEMS (Open Elective – III)

IV -B.Tech.-I-Sem

Subject Code: 17EC4104OE

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the basic concepts of embedded computing	3	3	2	2
CO2	illustrate the architecture of 8051 microcontroller	3	3	3	2
CO3	develop embedded programs using 8051 microcontroller	3	3	3	2
CO4	demonstrate 8051 microcontroller interface with peripherals	3	3	3	2
CO5	explain real time operating system concepts	3	3	3	3

WEB TECHNOLOGIES (Open Elective – III)

IV – B.Tech. – I - Semester

Subject Code: 17CS4104OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2

COMPUTER NETWORKS (Professional Elective – II)

IV – B.Tech. – I – Sem

Subject Code: 17EC4105PE

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO12	PO13



CO1	outline the basics of computer networks and various layers	3	2	2	3
CO2	demonstrate multiple access protocols	3	2	2	3
CO3	interpret network layer and routing algorithms	3	3	3	3
CO4	illustrate internetworking and various transport protocols	3	3	3	3
CO5	make use of various protocols of application layer	3	3	2	3

WIRELESS COMMUNICATIONS AND NETWORKS

(Professional Elective – II)

IV – B.Tech. – I – Sem
Subject Code: 17EC4106PE

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PO13
CO1	explain the basic concepts of cellular system design fundamentals	3	2	2	2	2	3
CO2	illustrate mobile radio propagation	3	2	2	2	2	3
CO3	analyze OFDM for wireless communication	3	3	3	3	2	3
CO4	discuss equalization and diversity	3	3	2	2	2	3
CO5	use of the existing and emerging Bluetooth and wireless standards	3	3	2	3	2	3

BIO MEDICAL INSTRUMENTATION

(Professional Elective – II)

IV B.Tech I Sem
SUBJECT CODE: 17EC4107PE

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO13
CO1	explain the concept of biomedical instrumentation	2	2	2	2	3
CO2	discuss bio potential electrodes and physiological transducers	3	3	3	3	3
CO3	analyze cardiac instrumentation	3	3	3	3	3
CO4	use operation theatre equipment	3	3	3	2	3
CO5	demonstrate the electrical safety of medical equipment	3	3	3	3	3

CODING THEORY AND TECHNIQUES

(Professional Elective – II)

IV -B.Tech.-I-SEM
Subject Code: 17EC4108PE

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PO13
CO1	explain the basics of Coding for Reliable digital tTransmission and storage	3	3	3	2	3
CO2	discuss cyclic codes	3	3	2	2	3
CO3	outline the concepts of convolution codes	3	3	2	2	3
CO4	analyze and perform Turbo codes	3	3	3	2	3
CO5	interpret the space time codes	3	3	3	2	3

CELLULAR AND MOBILE COMMUNICATIONS LAB

IV -B.Tech.-I-SEM
Subject code: 17EC4109PC

L T P C
- - 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	design hexagonal cell, Frequency Reuse ,Cell splitting, Interference & Diversity Techniques	3	3	3
CO2	solve the Propagation Models & Path Loss Estimation, Antennas Multipath	3	3	3



	Fading and Channel Assignment			
CO3	develop the Handoffs , Dropped Call Rates and rake receiver	3	3	3
CO4	analysis and design of 3G,GSM & CDMA	3	3	3
CO5	develop OFDM & Satellite Link	3	3	3

VLSI DESIGN LAB

IV-B.Tech.-I-Sem.

Subject Code: 17EC4110PC

L T P C

- - 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	test logic gates	3	3	3
CO2	design combinational circuits	3	3	3
CO3	develop sequential circuits	3	3	3
CO4	analyze finite state machines	3	3	3
CO5	construct CMOS circuit schematics and their layouts	3	3	3

FOREIGN LANGUAGE: FRENCH MANDATORY COURSE (NON-CREDIT)

IV-B.Tech.-I-Sem.

Subject Code: 17HS4112MC

L T P C

3 0 0 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	identify the basic structure of French language, spelling and pronunciation	3	3
CO2	reproduce the grammatical structure for basic communication	3	3
CO3	recognize and use the grammatical structures for general comprehension	3	3
CO4	use the grammatical and lexical notions in formal and informal situations	3	3
CO5	apply the language skills in communicating effectively at a global platform	3	3

FOREIGN LANGUAGE: GERMAN MANDATORY COURSE (NON-CREDIT)

IV-B.Tech.-I-Sem.

Subject Code: 17HS4113MC

L T P C

3 0 0 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	identify the basic structure of German language, spelling and pronunciation	3	3
CO2	reproduce the grammatical structure for self introduction	3	3
CO3	recognize and use the grammatical article structures for basic conversation	3	3
CO4	use the grammatical and verb structure for formal and informal situations	3	3
CO5	apply the language skills in communicating effectively at a global platform	3	3

INTERNET OF THINGS

IV – B.Tech. – II – Sem

Subject Code: 17EC4201ES

L T P C

4 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PO13
CO1	explain IoT and its components	3	2	3	3	3	3
CO2	interface I/O devices, sensors and communication modules	3	2	3	3	3	3
CO3	design IoT methodology using python	3	3	3	3	3	3

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CO4	solve IoT application frame work	3	3	3	3	3	3
CO5	develop IoT for real time applications	3	2	3	3	3	3

DIGITAL SIGNAL PROCESSORS AND CONTROLLERS (Professional Elective-III)

IV -B.Tech.-II-Sem
Subject Code: 17EC4202PE

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO13
CO1	illustrate DSP architectures for programmable DSP	3	2	2	2	3
CO2	analyze programmable digital signal processors	3	3	2	2	3
CO3	explore the architecture of different ARM Processors	3	3	3	2	3
CO4	construct ASM level program using the instruction set	3	3	3	2	3
CO5	develop DSP and ARM processors applications	3	3	3	2	3

RADAR SYSTEMS (Professional Elective-III)

IV -B.Tech.-II-Sem
Subject Code: 17EC4203PE

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PO13
CO1	outline radar fundamentals and radar equation	3	2	2	2	3
CO2	explain various types of radars	3	2	2	2	3
CO3	summarize the working principle of CW-FM radar	3	2	2	2	3
CO4	illustrate target detection and tracking	3	2	2	2	3
CO5	classify various transmitters & receivers	3	3	3	2	3

ARTIFICIAL NEURAL NETWORKS (Professional Elective-III)

IV -B.Tech.-II-Sem
Subject Code: 17EC4204PE

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PO13
CO1	illustrate the functionalities of Neural Networks and Learning process	3	3	2	3	2	3
CO2	analyze the single-layer and multi-layer perceptrons	3	3	3	3	2	3
CO3	explain back propagation	3	3	3	3	2	3
CO4	interpret self-organization maps	3	3	3	3	2	3
CO5	outline neuro dynamics	3	2	3	3	3	3

TELEVISION ENGINEERING (Professional Elective – III)

IV -B.Tech.-II-Sem.
Subject Code: 17EC4205PE

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO6	PO7	PO12	PO13
CO1	explain the fundamental concepts of television	3	2	2	3	2	3
CO2	outline monochrome television systems used worldwide and its compatibility	3	2	3	3	2	3
CO3	discuss formation of color picture and working of color picture tubes	3	3	3	3	2	3

(Signature)

CO4	demonstrate colour TV transmission and reception	3	3	3	3	3	3
CO5	analyze advanced television systems	3	3	3	3	3	3

DATA ANALYTICS & MACHINE LEARNING

(Professional Elective – IV)

IV -B.Tech.-II-Sem

Subject Code:17EC4206PE

Pre- requisites :

L T P C

4 1 0 4

- Programming Language(preferably Java), SQL (queries and sub queries),
- A Course on “Statistical and Numerical Methods & “Data Warehousing and Data Mining”

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	explain basic concepts of Big Data	3	3	2	2	3
CO2	outline the functionalities of hadoop distributed file system	3	3	2	3	3
CO3	discuss the hadoop eco systems	3	3	3	3	3
CO4	elaborate machine learning process	3	3	3	3	3
CO5	analyze learning	3	3	3	3	3

DIGITAL IMAGE PROCESSING

(Professional Elective – IV)

IV B.Tech ECE II-Sem

Subject Code: 17EC4207PE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO12	PO13
CO1	explain image fundamentals and transforms	3	2	2	3
CO2	utilize image enhancement and color image processing techniques	3	3	3	3
CO3	make use of image restoration techniques and wavelets	3	3	3	3
CO4	apply image segmentation and morphological image processing	3	3	3	3
CO5	analyze image compression techniques	3	3	3	3

RF CIRCUIT DESIGN

(Professional Elective – IV)

IV -B.Tech.-II-Sem

Subject Code: 17EC4208PE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO13
CO1	illustrate RF circuits and transmission line theory	3	2	2	2	3
CO2	demonstrate the single port, multiport networks	3	3	3	3	3
CO3	outline the active RF component modeling	3	2	3	3	3
CO4	explain matching and biasing networks	3	2	3	3	3
CO5	analyze RF transistor amplifier and Oscillators	3	3	3	3	3

ADHOC WIRELESS SENSOR NETWORKS

(Professional Elective – IV)

IV -B.Tech.-II-Sem

Subject Code: 17EC4209PE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	explain basic concepts of Ad-hoc wireless networks	3	2	2	2	3
CO2	summarize the working and the performance of MAC layer Protocols	3	2	3	3	3
CO3	discuss operation of routing protocol	3	3	3	3	3

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CO4	outline the performance of transport layer protocol	3	2	3	3	3
CO5	analyze wireless sensor network Architecture & Protocols	3	3	3	3	3



Academic Regulations (R18)
B.Tech. - Regular Four Year Degree Programme (ECE)
(For batches admitted from the academic year 2018 - 19)
Department of Electronics and Communication Engineering
ENGINEERING MATHEMATICS – I
(Linear Algebra and Calculus)

I-B.Tech-I-Sem. **L T P C**
Subject Code BSC-101 **3 1 - 4**
Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	analyze the nature of sequences and series	3	2	1
CO4	verify mean value theorems and evaluate improper integrals by using Beta and Gamma functions	3	2	1
CO5	find the extreme values of functions of two variables	3	2	1

ENGINEERING CHEMISTRY

I-B.Tech.-I-Sem. **L T P C**
Subject Code: BSC-107 **3 - - 3**
Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1
CO4	illustrate the various fuels, synthesis of polymers and drugs	3	2	1
CO5	analyze the properties of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

I-B.Tech.-I-Sem. **L T P C**
Subject Code: ESC-101 **3 - - 3**
Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	explain the concepts of single phase and three phase AC circuits	3	3	2	1
CO3	elaborate the working principles and construction of AC and DC machines	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1

PROGRAMMING FOR PROBLEM SOLVING

I-B.Tech.- I- Sem. **L T P C**
Subject Code: ESC-103 **3 - - 3**
Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

ENGINEERING CHEMISTRY LAB

I-B.Tech.-I-Sem. **L T P C**
Subject Code: BSC-108 **- - 3 1.5**
Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	determine the hardness in water samples to solve societal problems	3
CO2	estimate the strength of the given solutions	3



CO3	analyze adsorption and viscosity of various fluids	3
CO4	synthesize the various organic compounds used in medical industry	3
CO5	verify and understand the distribution coefficient	3

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB

I-B.Tech.-I-Sem.

L T P C

Subject Code: ESC-102

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws and network theorems	3
CO2	find the efficiency of AC and DC machines	3
CO3	verify the V-I characteristics of various electronic devices	3
CO4	determine the efficiency of various rectifiers	3
CO5	illustrate the configurations of Bi-polar junction transistor	3

PROGRAMMING FOR PROBLEM SOLVING LAB

I-B.Tech-I-Sem.

L T P C

Subject Code: ESC-104

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3
CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3

IT & ENGINEERING WORKSHOP

I-B.Tech.-I-Sem.

L T P C

Subject Code: ESC-110

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	install and make use of operating systems and MS office tools	3	3	2	2
CO2	configure fire walls and trouble shoot network connections	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2

TECHNOLOGY EXPLORATION FOR SOCIAL INNOVATION LAB - I MANDATORY COURSE (NON-CREDIT)

I-B.Tech.-I-Sem.

L T P C

Subject Code: MC-101

- 3 - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	identify the problems	3
CO2	illustrate social innovation	3
CO3	choose suitable processes	3
CO4	design suitable prototype	3
CO5	develop feasibility report	3

ENGINEERING MATHEMATICS – II (Advanced Calculus)

I-B.Tech.-II-Sem.

L T P C

Subject Code: BSC-102

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1

CO2	solve linear and non-linear partial differential equations	3	2	1
CO3	evaluate the line, surface and volume integrals and convert them from one to another by using multiple integrals	3	2	1
CO4	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

APPLIED PHYSICS

I-B.Tech.-II- Sem.

Subject Code: BSC-103

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the principles of Quantum Mechanics	3	2	1
CO2	analyze various electron theories of conduction in solids	3	2	1
CO3	classify semiconductors and relate functioning of semiconductor devices	3	2	1
CO4	illustrate principles and applications of lasers and optical fibers	3	2	1
CO5	outline dielectric and magnetic properties of materials	3	2	1

ENGLISH

I-B.Tech.-II-Sem.

Subject Code: HSMC-101

L T P C

2 - - 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in RAWLS skills	3	1
CO2	demonstrate the acquired language in written and spoken contexts	3	1
CO3	express, restate and respond appropriately by comprehending the given data	3	1
CO4	develop proficiency to succeed in academic activities, research and career	3	1
CO5	excel in professional and social etiquette	3	1

DATA STRUCTURES

I-B.Tech.-II-Sem.

Subject Code: ESC-105

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	classify different data structures to design efficient programs	3	3	2	2
CO2	identify appropriate sorting and searching techniques	3	2	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	explain various concepts of non-linear data structures	3	3	2	2
CO5	choose an appropriate hashing technique for a given problem	3	3	2	2

ENGINEERING GRAPHICS

I-B.Tech.-II-Sem.

Subject Code: ESC-109

L T P C

1 - 4 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2

APPLIED PHYSICS LAB

I-B.Tech.-II-Sem.

Subject Code: BSC-104

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4

CO1	demonstrate the electrical properties of a semiconductor	3
CO2	compare practical results with theoretical calculations in electrical circuits	3
CO3	demonstrate the properties of lasers and optical fibers	3
CO4	find the energy gap of a semiconductor and identify its band structure	3
CO5	examine electrical resonance in LCR circuits	3

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

I- B.Tech-II-Sem.

L T P C

Subject Code: HSMC-102

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	identify the nuances of the language through multimedia experience	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3
CO4	develop speaking and listening skills	3	3
CO5	appraise communication and correspond effectively	3	3

DATA STRUCTURES LAB

I-B.Tech.-II-Sem.

L T P C

Subject Code: ESC-106

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	implement various searching and sorting techniques	3
CO2	demonstrate basic operations of stack and queues using arrays and linked lists	3
CO3	apply stack data structure to solve various computing problems	3
CO4	demonstrate and apply different methods for traversing graphs	3
CO5	construct binary search tree	3

TECHNOLOGY EXPLORATION FOR SOCIAL INNOVATION LAB - II MANDATORY COURSE (NON-CREDIT)

I-B.Tech.-II-Sem.

L T P C

Subject Code: MC-102

- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	deploy suitable mechanisms	3
CO2	develop platform based innovations	3
CO3	demonstrate data acquisition and analytical skills	3
CO4	execute projects using suitable management techniques	3
CO5	adapt ethics and code of conduct	3

NUMERICAL METHODS AND COMPLEX VARIABLES

II-B.Tech.-I-Sem.

L T P C

Subject Code: BSC-202

3 1 - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve transcendental, linear and non-linear system of equations using numerical methods	3	2	1
CO2	find the numerical solutions for first order initial value problems and integrals	3	2	1
CO3	solve ODE by using Laplace transforms	3	2	1
CO4	analyze the complex functions with reference to their analyticity	3	2	1
CO5	expand complex functions using Taylor's, Laurent's and Residue theorems	3	2	1

NETWORKS AND MEASUREMENTS

II-B.Tech.-I-Sem.

L T P C

Subject Code: ESC-207

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO13

[Signature]

CO1	assess the parameters of two port networks	3	3	2	2	3
CO2	evaluate the transient analysis in electrical circuits	3	3	2	2	3
CO3	design resonant circuits and magnetic circuits	3	3	2	2	3
CO4	analyze various filters and DC bridges	3	3	2	2	3
CO5	determine unknown parameters of AC bridges	3	3	2	2	3

PROBABILITY THEORY AND STOCHASTIC PROCESSES

II-B.Tech.-I-Sem.

L T P C

Subject Code: ESC-208

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	apply the concepts of probability and random variables	3	3	2	3
CO2	evaluate the distribution and density functions of single random variables	3	3	2	3
CO3	solve the problems related to multiple random variables	3	3	2	3
CO4	analyze the stochastic process and its temporal characteristics	3	3	2	3
CO5	outline the spectral characteristics of stochastic process	3	3	2	3

ANALOG ELECTRONICS

II-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-211

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO13
CO1	analyze single stage amplifiers at low frequencies	3	3	2	2	3
CO2	design multistage amplifiers at high frequencies using transistors	3	3	2	2	3
CO3	illustrate feedback amplifiers and oscillators	3	3	2	2	3
CO4	examine the power and tuned amplifiers	3	3	2	2	3
CO5	interpret various FET Amplifiers	3	3	2	2	3

SIGNALS AND SYSTEMS

II-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-212

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	interpret various types of signals and systems	3	3	2	3
CO2	determine the convolution and correlation on various signals	3	3	2	3
CO3	evaluate the response of the systems using Laplace and Z-transforms	3	3	3	3
CO4	determine the convolution and correlation on various signals	3	3	2	3
CO5	apply the mathematical modelling to LTI systems for processing signals	3	3	3	3

ANALOG ELECTRONICS LAB

II-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-213

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	design and analyze the transistor amplifier circuits	3	3	3
CO2	design and analyze the FET amplifiers	3	3	3
CO3	Design and analyze the feedback amplifiers	3	3	3
CO4	Design and analyze the Oscillators	3	3	3
CO5	Design and analyze the large signal amplifiers	3	3	3

NETWORKS AND MEASUREMENTS LAB

II-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-214

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14



CO1	design two port network to verify various parameters	3	3	3
CO2	analyze transients for series circuits using DC excitation	3	3	3
CO3	evaluate resonance and magnetic circuits	3	3	3
CO4	design filters and draw its characteristics	3	3	3
CO5	examine unknown components of various bridges	3	3	3

SCRIPTING LANGUAGES LAB

II-B.Tech.-I-Sem.

L T P C

Subject Code: ESC-209

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PO14
CO1	distinguish various scripting languages	3	3	3	3	3	3
CO2	develop programs using shell script	3	3	3	3	3	3
CO3	create applications using PHP	3	3	3	3	3	3
CO4	build applications using perl	3	3	3	3	3	3
CO5	construct programs using python	3	3	3	3	3	3

COMPUTATIONAL MATHEMATICS LAB USING Sci LAB

II-B.Tech-I-Sem.

L T P C

Subject Code: BSC-203

- - 3 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO14
CO1	solve problems on Linear Algebra and plotting of Graphs	3	3	3	3
CO2	find roots of an equation using various Methods	3	3	3	3
CO3	fit a curve for straight line, parabola, exponential and power curves	3	3	3	3
CO4	solve ordinary differential equations using Numerical techniques	3	3	3	3
CO5	solve ordinary integral equations using Numerical techniques	3	3	3	3

ENVIRONMENTAL SCIENCES MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-I-Sem.

L T P C

Subject Code: MC-202

2 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2

PULSE & DIGITAL CIRCUITS

II-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-221

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	design of linear wave shaping circuits for various applications	3	3	2	3
CO2	construct nonlinear wave shaping circuits	3	3	2	3
CO3	demonstrate the switching characteristics of diode and transistor	3	3	2	3
CO4	design and analyze multi-vibrator circuits and time-base generators	3	3	2	3
CO5	develop circuits using the concepts of sampling gates and logic families	3	3	2	3

LINEAR AND DIGITAL IC APPLICATIONS

II-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-222

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
-----	--	-----	-----	------	------



CO1	describe various stages of operational amplifier	3	2	2	3
CO2	design active filters, PLL and 555 timers	3	3	2	3
CO3	analyze various ADCs and DACs	3	3	2	3
CO4	construct various combinational circuits using IC's	3	3	2	3
CO5	build various sequential circuits using IC's	3	3	2	3

LECTROMAGNETIC THEORY AND TRANSMISSION LINES

II-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-223

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	illustrate the concepts of electric fields	3	2	2	3
CO2	interpret the concepts of magnetic fields	3	2	2	3
CO3	explain EM wave characteristics	3	3	2	3
CO4	summarize the fundamental concepts of transmission line theory	3	3	2	3
CO5	analyze transmission lines using smith chart or classical theory	3	3	2	3

DIGITAL DESIGN AND COMPUTER ORGANIZATION

II-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-224

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	interpret number systems and codes	3	2	2	3
CO2	solve boolean expressions and analyze combinational circuits	3	3	3	3
CO3	design the sequential circuits	3	3	3	3
CO4	illustrate various micro operations	3	2	2	3
CO5	explain basics of various types of memories	3	2	2	3

CONTROL SYSTEMS

II-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-225

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain mathematical models of control systems in continuous time	3	3	2
CO2	determine the transient and steady state performances of a control system	3	3	2
CO3	analyze the stability by using R-H criterion and root-locus concepts	3	3	2
CO4	evaluate the stability analysis in frequency domain	3	3	2
CO5	examine the controllability and observability of a system	3	3	2

PULSE & DIGITAL CIRCUITS LAB

II-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-226

- - 3 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	design linear and non linear wave shaping circuits	3	3	3
CO2	analyze multivibrators and its applications	3	3	3
CO3	create oscillations and sweep signals using UJT and Boot strap circuits	3	3	3
CO4	illustrate the switching characteristics of transistor	3	3	3
CO5	demonstrate the operation of logic gates and sampling gates	3	3	3

LINEAR & DIGITAL IC APPLICATIONS LAB

II-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-227

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	construct circuits for various applications using Op-Amp IC741	3	3	3

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CO2	design various applications with specific ICs	3	3	3
CO3	model various sequential and combinational circuits using digital ICs	3	3	3
CO4	design and analyze synchronous and asynchronous counters using digital ICs	3	3	3
CO5	implement the sequential circuits	3	3	3

SIMULATION LAB

II-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-228

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	interpret various types of signals and systems with the basic signal operations	3	3	3
CO2	analyze the signals in frequency domain using Fourier Transform and Z Transform	3	3	3
CO3	evaluate the distribution and density functions of single random variables	3	3	3
CO4	examine the stability of the control systems by using R-H criterion and root-locus concepts	3	3	3
CO5	apply the concepts of electric field and electric potential	3	3	3

DIGITAL DESIGN LAB THROUGH VERILOG

II-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-229

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	examine basic logic gates	3	3	3
CO2	implement boolean functions using universal gates	3	3	3
CO3	construct various combinational logic circuits	3	3	3
CO4	analyze the operation of flip-flops	3	3	3
CO5	design registers and counters using flip-flops	3	3	3

GENDER SENSITIZATION LAB (MANDATORY COURSE - NON- CREDIT)

II-B.Tech.-II-Sem.

L T P C

Subject Code: MC-201

- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

ANALOG AND DIGITAL COMMUNICATION

III-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-311

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PO13
CO1	analyze various analog modulation and demodulation schemes	3	3	2	2	3
CO2	explain various angle modulation and demodulation schemes	3	3	2	2	3
CO3	demonstrate AM, FM transmitters and receivers	3	3	2	2	3
CO4	distinguish pulse modulation and pulse code modulation schemes	3	3	2	2	3
CO5	illustrate digital modulation schemes and compute BER	3	3	2	2	3

ANTENNAS AND WAVE PROPAGATION

III-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-312

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	explain the radiation of electromagnetic waves from antennas	3	3	2	3
CO2	implement antenna arrays	3	3	2	3
CO3	design antennas at HF and VHF	3	3	3	3
CO4	analyze antennas at UHF and measure antenna parameters	3	3	3	3
CO5	identify the characteristics and effects on Radio Wave Propagation	3	3	2	3

DIGITAL SIGNAL PROCESSING

III-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-313

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	analyze discrete times signals in the time and frequency domains	3	3	2	3	3
CO2	implement DFT and FFT on time domain signals	3	3	2	3	3
CO3	design IIR filters using various techniques	3	3	2	3	3
CO4	design FIR filters using various techniques	3	3	2	3	3
CO5	illustrate Multirate Signal Processing	3	3	2	2	3

MICROPROCESSORS AND MICROCONTROLLERS

III-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-314

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PO13
CO1	illustrate the internal architecture and organization of 8086	3	3	2	2	3
CO2	analyze 8086 ALPs and interfacing devices	3	3	2	2	3
CO3	explain the architecture of 8051 microcontroller	3	3	2	3	3
CO4	interface memory, I/O and advanced peripherals with 8051	3	3	2	3	3
CO5	adapt the architecture and instruction set of ARM processor	3	3	2	3	3

INTERNET OF THINGS

III-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-315

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PO13
CO1	explain IoT and its components	3	2	3	3	3	3
CO2	interface I/O devices, sensors and communication modules	3	2	3	3	3	3
CO3	design IoT methodology using python	3	3	3	3	3	3
CO4	solve IoT application frame work	3	3	3	3	3	3
CO5	develop IoT for real time applications	3	2	3	3	3	3

ANALOG AND DIGITAL COMMUNICATION LAB

III-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-316

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	test analog modulation and demodulation techniques	3	3	3
CO2	demonstrate time and frequency division multiplexing	3	3	3
CO3	design the pulse modulation and demodulation techniques	3	3	3
CO4	compare PCM, DPCM and DM	3	3	3
CO5	classify digital modulation and demodulation waveforms	3	3	3

DIGITAL SIGNAL PROCESSING LAB

III-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-317

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	classify various types of signals and perform linear operations on the signals	3	3	3
CO2	compute linear and circular convolution	3	3	3

[Signature]

CO3	analyze the principles of DIT FFT and DIF FFT algorithms	3	3	3
CO4	design digital IIR and FIR filter using various techniques	3	3	3
CO5	apply Multirate concepts in sampling rate conversion applications	3	3	3

MICROPROCESSORS AND MICROCONTROLLERS LAB

III-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-318

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	interpret programs for various problems using 8086 microprocessor	3	3	3
CO2	develop interfacing between 8086 microprocessor and various peripherals	3	3	3
CO3	compile programs on Microcontroller based systems	3	3	3
CO4	interface 8051 ports with various peripherals	3	3	3
CO5	design Microprocessor and Microcontroller based systems	3	3	3

INTERNET OF THINGS LAB

III-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-319

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	improve working on basic IoT devices	3	3	3
CO2	determine learning and utilization of IoT devices	3	3	3
CO3	develop automation work-flow in IoT enabled environment	3	3	3
CO4	recommend working on advance IoT systems	3	3	3
CO5	take part in practicing and monitoring remotely	3	3	3

EMPLOYABILITY SKILLS – I MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-I-Sem.

L T P C

Subject Code: MC-311

3 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3
CO3	build proficiency in quantitative reasoning	3	3
CO4	improve critical thinking skills	3	3
CO5	exhibit confidence in facing the interview process	3	3

SUMMER INTERNSHIP - I MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-I-Sem.

L T P C

Subject Code: MC-312

- - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

MICROWAVE ENGINEERING

III-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-321

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	identify the need of microwaves and transmission line characteristics	3	2	2	3



CO2	analyze electromagnetic wave propagation and microwave components	3	3	2	3
CO3	explain the operation of various microwave tubes	3	2	2	3
CO4	determine measurement parameters using microwave equipments	3	3	2	3
CO5	develop microwave systems for various applications	3	3	2	3

VLSI DESIGN

III-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-322

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PO13
CO1	interpret various MOS transistor fabrication techniques	3	2	3	3	3
CO2	illustrate operation and electrical characteristics of MOS transistor	3	2	2	3	3
CO3	discuss VLSI Design flow, Stick diagrams, layout, design rules	3	3	2	3	3
CO4	outline the concepts of MOS circuits	3	3	2	3	3
CO5	interpret scaling and various levels of CMOS testing	3	3	2	3	3

ARTIFICIAL INTELLIGENCE

III-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-323

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12	PO13
CO1	explain the concepts of artificial intelligence	3	3	3	3	2	3
CO2	illustrate various search algorithms	3	3	3	3	2	3
CO3	adapt various probabilistic reasoning approaches	3	3	2	3	3	3
CO4	elaborate Markov decision process	3	3	2	3	2	3
CO5	perceive various reinforcement learning approaches	3	3	2	3	3	3

INFORMATION THEORY AND CODING

(Professional Elective –I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PEC-301

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PO13
CO1	apply the concepts of information theory and entropy	3	3	3	2	3
CO2	explain communication channel models	3	3	2	2	3
CO3	analyze various channel coding techniques	3	3	2	2	3
CO4	design BCH codes	3	3	3	2	3
CO5	develop error control codes	3	3	3	2	3

DATA MINING AND ANALYTICS

(Professional Elective –I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PEC-302

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	summarize fundamentals of data mining	3	2	2	2
CO2	illustrate various mining association rules	3	3	2	2
CO3	make use of classification and clustering techniques	3	3	3	2
CO4	outline various data analytics techniques	3	2	2	2
CO5	solve statistical problems using R programming	3	3	3	3

DIGITAL IMAGE PROCESSING

(Professional Elective –I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PEC-303

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



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COs	Upon completion of course the students will be able to	PO2	PO5	PO12	PO13
CO1	explain image fundamentals and transforms	3	2	2	3
CO2	utilize image enhancement and color image processing techniques	3	3	3	3
CO3	make use of image restoration techniques and wavelets	3	3	3	3
CO4	apply image segmentation and morphological image processing	3	3	3	3
CO5	analyze image compression techniques	3	3	3	3

OPERATING SYSTEMS
(Professional Elective –I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PEC-304

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	outline various concepts operating systems and Linux utilities	3	3	2
CO2	solve synchronization problems by using process management and API s	3	3	2
CO3	adapt various deadlock handling and memory management mechanism	3	3	2
CO4	analyze various file management system	3	3	2
CO5	make use of I/O Management and security mechanisms	3	3	2

DISASTER MANAGEMENT
(Open Elective - I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-301

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

FUNDAMENTALS OF OPERATIONS RESEARCH
(Open Elective-I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-302

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	formulate and solve linear programming problem using various methods	3	2	3
CO2	solve transportation and assignment problems	3	3	3
CO3	compute sequencing and inventory model problems	2	2	3
CO4	analyze waiting lines and game theory problems	3	3	3
CO5	evaluate replacement and dynamic programming problems	2	3	3

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Open Elective-I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-303

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

JAVA PROGRAMMING
(Open Elective-I)

III-B.Tech.-II-Sem.

L T P C



Subject Code: OEC-304

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	create packages and interfaces	3	2	3	3	2
CO4	build efficient code using multithreading and exception handling	3	2	3	3	2
CO5	design real-time applications using applets	3	2	3	3	2

INDIAN CULTURE AND CONSTITUTION

(Open Elective-I)

III-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-305

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	1
CO2	explain features of languages, religions and holy books	3	2
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	2

MICROWAVE ENGINEERING LAB

III-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-324

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	interpret the characteristics of microwave devices	3	3	3
CO2	determine scattering parameters of various microwave components	3	3	3
CO3	analyze various parameters of waveguide components	3	3	3
CO4	measure VSWR and antenna pattern	3	3	3
CO5	design a microwave communication link using microwave bench	3	3	3

VLSI DESIGN LAB

III-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-325

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	test logic gates	3	3	3
CO2	design combinational circuits	3	3	3
CO3	develop sequential circuits	3	3	3
CO4	analyze finite state machines	3	3	3
CO5	construct CMOS circuit schematics and their layouts	3	3	3

ARTIFICIAL INTELLIGENCE LAB

III-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PCC-326

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	illustrate various search techniques	3	3	3
CO2	solve real-time problems using graph theory	3	3	3
CO3	develop various games using AI techniques	3	3	3
CO4	adapt Bayesian probability model	3	3	3
CO5	design programs based on Markov decision process	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

III-B.Tech.-II-Sem.

L T P C

Subject Code: HSMC-301

1 - 2 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3

EMPLOYABILITY SKILLS – II
MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-II-Sem.

L T P C

Subject Code: MC-321

3 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	make use of soft skills to become a professional team member	3	3
CO2	develop professional correspondence skills	3	3
CO3	apply knowledge of decision making, leadership, motivation	3	3
CO4	adapt principles of quantitative aptitude to achieve qualitative results	3	3
CO5	exhibit confidence in facing the interview process	3	3

DATA COMMUNICATION & COMPUTER NETWORKS

IV-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-411

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PO13
CO1	explain basics of networking and physical layer	3	2	3
CO2	interpret protocols of data link layer	3	2	3
CO3	illustrate network layer and communication protocols	3	2	3
CO4	outline transport layer protocols	3	2	3
CO5	make use of various protocols of application layer	3	2	3

SATELLITE COMMUNICATIONS
(Professional Elective – II)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PEC-401

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	summarize orbital effects on satellite communications	3	2	3	2	3
CO2	interpret the subsystems of satellite	3	3	3	3	3
CO3	classify various multiple access and spread spectrum techniques	3	3	2	2	3
CO4	compare satellite subsystems with earth station technology	3	3	3	2	3
CO5	outline the satellite navigation and global positioning system	3	3	3	3	3

MACHINE LEARNING AND DATA SCIENCES
(Professional Elective - II)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PEC-405

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	demonstrate the required mathematical foundations for ML& DS	3	3	3	3	3
CO2	outline the functionalities of machine learning	3	3	3	3	3
CO3	illustrate learning algorithms & data science basics	3	3	2	2	3
CO4	build data science applications using Python based toolkits	3	3	3	3	3
CO5	use recommender systems and sentiment analysis in real time	3	3	3	3	3

applications						
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EMBEDDED SYSTEMS
(Professional Elective – II)

IV-B.Tech-I-Sem.

L T P C

Subject Code: EC-PEC-409

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PO13
CO1	analyze the basic concepts of embedded systems	3	2	2	2	3	3
CO2	illustrate typical embedded system	3	2	3	3	3	3
CO3	adapt the knowledge of interfacing in embedded domain	3	3	3	2	3	3
CO4	compile embedded systems programming	3	3	3	2	3	3
CO5	explain the various real time operating system concepts	3	2	3	2	3	3

CYBER-PHYSICAL SYSTEMS
(Professional Elective – II)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PEC-413

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PO13
CO1	outline the necessity of cyber physical system	3	2	2	3	2	3
CO2	analyse the future challenges & social impact of CPS	3	3	3	3	3	3
CO3	illustrate the computing fundamentals of CPS	3	3	3	2	2	3
CO4	demonstrate the applications & system requirements of CPS	3	3	3	2	3	3
CO5	appraise various applications of CPS	3	3	3	3	3	3

RADAR ENGINEERING
(Professional Elective – III)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PEC-402

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PO13
CO1	outline radar fundamentals and radar equation	3	2	2	2	3
CO2	explain various types of radars	3	2	2	2	3
CO3	summarize the working principle of CW-FM radar	3	2	2	2	3
CO4	illustrate target detection and tracking	3	2	2	2	3
CO5	classify various transmitters & receivers	3	3	3	2	3

BLOCKCHAIN TECHNOLOGY
(Professional Elective - III)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PEC-406

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PO13
CO1	explain the fundamentals of Blockchain techniques	3	2	2	3	3	3
CO2	analyze various consensus problems	3	3	3	3	2	3
CO3	adapt Blockchain technology to improve business	3	3	3	3	2	3
CO4	make use of Ethereum frameworks to write smart contract	3	3	3	3	2	3
CO5	interpret Blockchain technology in real time applications	3	3	3	3	2	3

LOW POWER VLSI DESIGN
(Professional Elective – III)

IV-B. Tech.-I-Sem.

L T P C

Subject Code: EC-PEC-410

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	explain the concepts of low-power design	3	2	2	2	3
CO2	design low-voltage and low-power circuits	3	3	3	3	3



CO3	apply low power design techniques	3	3	3	3	3
CO4	develop low-voltage low power adders and multipliers	3	3	3	3	3
CO5	evaluate low-voltage low-power memories	3	3	3	3	3

DIGITAL MARKETING
(Professional Elective – III)

IV-B. Tech.-I-Sem.

Subject Code: EC-PEC-414

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	outline the importance of digital marketing	2	1	2	3	3	3
CO2	use search engine optimization to achieve business goals	3	2	3	3	3	3
CO3	adapt social media for business promotion	3	3	3	3	3	3
CO4	identify link building techniques for content consideration	3	2	3	3	3	3
CO5	apply digital marketing techniques in real time applications	3	3	3	3	3	3

CELLULAR AND MOBILE COMMUNICATIONS
(Professional Elective – IV)

IV-B. Tech.-I-Sem.

Subject Code: EC-PEC-403

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	demonstrate the performance criteria of cellular systems	3	2	2	3	3
CO2	identify various types of interference and frequency planning	3	2	2	3	3
CO3	illustrate cell coverage, cell site and mobile antennas	3	2	2	3	3
CO4	summarize frequency management and channel assignment	3	2	2	3	3
CO5	classify various multiple access and spread spectrum techniques	3	2	2	3	3

FPGA – CPLD ARCHITECTURES
(Professional Elective – IV)

IV-B. Tech.-I-Sem.

Subject Code: EC-PEC-407

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	apply knowledge of logic gates for various design applications	3	3	3	3	3
CO2	get familiar with Programmable Logic CPLD's	3	2	2	3	3
CO3	comprehend FPGA Architectures	3	3	3	3	3
CO4	Illustrate various architectures and device technologies of PLD's	3	2	2	3	3
CO5	analyze system level design on FPGA architectures	3	3	3	3	3

CYBER SECURITY
(Professional Elective – IV)

IV-B. Tech.-I-Sem.

Subject Code: EC-PEC-411

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO4	PO5	PO6	PO8	PO12	PO13
CO1	explain cyber security terminologies	2	2	2	2	2	2	2
CO2	identify various cyber offences	3	3	3	3	3	3	3
CO3	apply various tools and methods to control cybercrime	3	3	3	3	3	3	3
CO4	make use of standards and cyber laws to enhance cyber security	3	3	3	3	3	3	3
CO5	illustrate the importance of security policies & IT Act	3	3	2	3	3	3	3

APPLICATION SPECIFIC INTEGRATED CIRCUITS
(Professional Elective – IV)

IV-B. Tech.-I-Sem.

Subject Code: EC-PEC-415

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13

CO1	explain various types of ASICs and its libraries	3	2	2	2	3
CO2	illustrate programmable ASICs and logic cells	3	3	3	3	3
CO3	make use of I/O cells, interconnects and programmable ASICs	3	3	3	3	3
CO4	summarize low level design entry and logic synthesis	3	3	3	3	3
CO5	design ASICs using various techniques	3	3	3	3	3

ENVIRONMENTAL IMPACT ASSESSMENT
(Open Elective-II)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: OEC-401

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO10	PO12
CO1	identify the attributes to be considered for EIA	3	3	3	3
CO2	assess impact of deforestation	3	3	3	3
CO3	interpret impact prediction, significance of soil quality and mitigation	3	3	2	3
CO4	conduct environmental audit and prepare reports	3	3	2	3
CO5	illustrate environmental policies and provisions	3	3	3	3

NON-CONVENTIONAL ENERGY SOURCES
(Open Elective-II)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: OEC-403

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO12
CO1	analyze global and national energy scenarios	3	3	3
CO2	illustrate the various solar energy systems	3	3	3
CO3	demonstrate the aspects related to wind energy power plants	3	3	3
CO4	build the power plants using bio gas	3	3	3
CO5	estimate the power generation in hydroelectric plants	3	3	3

PRINCIPLES OF COMMUNICATION SYSTEMS
(Open Elective-II)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: OEC-405

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the fundamentals of communication systems	3	2	2	2
CO2	analyze various analog modulation and demodulation schemes	3	3	3	2
CO3	explain sampling theorem, pulse modulation and multiplexing techniques	3	3	3	2
CO4	illustrate digital modulation schemes	3	3	2	2
CO5	develop source and channel coding techniques	3	3	3	2

DATABASE MANAGEMENT SYSTEMS
(Open Elective-II)

IV-B.Tech.-I-Sem.

L T P C

Subject Code: OEC-407

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2

INTELLECTUAL PROPERTY RIGHTS
(Open Elective-II)

IV-B.Tech.-I-Sem.

L T P C



Subject Code: OEC-409

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO8	PO10	PO12
CO1	outline basics of intellectual property law	3	3	2	3	3
CO2	identify the various trademarks	3	3	2	3	3
CO3	analyze patent and copy rights law	3	3	3	3	3
CO4	differentiate trade secret and unfair practice	3	3	3	3	3
CO5	summarize new developments in Intellectual Property Rights	3	3	3	3	3

TECHNICAL WRITING SKILLS LAB

IV-B.Tech.-I-Sem.

L T P C

Subject Code: HSMC-402

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	make use of language for understanding discourse and make notes	3	3
CO2	demonstrate command over using library resources for academic and other pursuits	3	3
CO3	apply knowledge of English language for creative and academic purposes	3	3
CO4	adapt principles in conveying good professional ethics	3	3
CO5	exhibit thorough awareness on research-oriented activities and career development	3	3

DATA COMMUNICATION & COMPUTER NETWORKS LAB

IV-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PCC-412

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	build the wireless LAN and Ethernet LAN protocols connection via hubs, switches	3	3	3
CO2	analyze the performance of various protocols in different layers	3	3	3
CO3	develop the communicate between two desktop computers via switch/router	3	3	3
CO4	apply network commands & configuration commands to network topologies	3	3	3
CO5	design of access control list configurations in packet tracer	3	3	3

PROJECT - I

IV-B.Tech.-I-Sem.

L T P C

Subject Code: EC-PRJ-413

- - 6 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3

**SUMMER INTERNSHIP - II
MANDATORY COURSE (NON-CREDIT)**

IV-B.Tech.-I-Sem.

L T P C

Subject Code: MC-411

- - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

MANAGEMENT, ECONOMICS AND ACCOUNTANCY

IV-B.Tech.-II-Sem.

Subject Code: HSMC-401

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	apply principles of management in professional career	3	2
CO2	make use of principles of economics for decision making	3	2
CO3	solve problems in the areas of production, cost and price	3	2
CO4	prepare balance sheet and maintain books of accounts	2	3
CO5	analyze financial performance of an enterprise	3	3

WIRELESS COMMUNICATIONS

(Professional Elective – V)

IV-B.Tech.-II-Sem.

Subject Code: EC-PEC-404

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PO13
CO1	explain the basic concepts of wireless sensor networks	3	2	2	2	2	3
CO2	illustrate various wireless sensor networks topologies	3	2	2	2	2	3
CO3	analyze routing and MAC protocols for WSN	3	3	3	3	2	3
CO4	outline transport layer protocols for Adhoc WSN	3	3	2	2	2	3
CO5	make use of security techniques, WSN platforms and tools	3	3	2	3	2	3

VIRTUAL REALITY

(Professional Elective – V)

IV-B.Tech.-II-Sem.

Subject Code: EC-PEC-408

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PO13
CO1	explain fundamental of virtual reality and 3D graphic systems	2	2	2	2	2	3
CO2	adapt geometric modeling in virtual reality environment	3	3	3	3	3	3
CO3	make use of virtual environment for animation and simulation	3	3	3	3	3	3
CO4	illustrate virtual reality hardware and software	3	2	3	3	2	3
CO5	develop virtual reality applications	3	3	3	3	3	3

QUANTUM COMPUTING

(Professional Elective - V)

IV-B.Tech.-II-Sem.

Subject Code: EC-PEC-412

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12	PO13
CO1	explain the concepts of quantum computing	3	2	2	2	2	3
CO2	make use of mathematical foundations for quantum computing	3	3	3	2	2	3
CO3	outline the architecture and programming models	3	2	2	2	3	3
CO4	utilize basic techniques of quantum computing	3	3	3	3	2	3
CO5	elaborate major algorithms and discuss about OSS toolkits	3	3	3	3	3	3

SOFTWARE DEFINED RADIO

(Professional Elective – V)

IV-B.Tech.-II-Sem.

Subject Code: EC-PEC-416

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PO13
CO1	explain the architecture of SDR	2	2	3	2	3	3
CO2	illustrate various digital frequency converters and digital filters	2	3	3	2	3	3
CO3	summarize signal processing components for software radio	3	3	3	2	3	3
CO4	identify various smart antennas for software radio	3	3	3	2	3	3

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CO5	outline various navigational systems	3	3	3	2	3	3
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GREEN BUILDING TECHNOLOGIES
(Open Elective-III)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-402

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO7	PO12
CO1	explain the fundamentals of energy use and processes in building	3	2	2	2
CO2	identify indoor environmental requirement and its management	3	3	3	2
CO3	assess the impact of solar radiation on buildings	3	3	3	2
CO4	evaluate end-use energy utilization and requirements	3	3	2	2
CO5	adapt audit procedures for energy management	3	3	3	2

FUNDAMENTALS OF ROBOTICS
(Open Elective-III)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-404

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2
CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate mechanical and electrical hardware for robot with feedback control	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

FUNDAMENTALS OF EMBEDDED SYSTEMS
(Open Elective – III)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-406

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the basic concepts of embedded computing	3	3	2	2
CO2	illustrate the architecture of 8051 microcontroller	3	3	3	2
CO3	develop embedded programs using 8051 microcontroller	3	3	3	2
CO4	demonstrate 8051 microcontroller interface with peripherals	3	3	3	2
CO5	explain real time operating system concepts	3	3	3	3

WEB TECHNOLOGIES
(Open Elective – III)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-408

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2

PRINCIPLES OF ENTREPRENEURSHIP
(Open Elective – III)

IV-B.Tech.-II-Sem.

L T P C

Subject Code: OEC-410

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
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CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3

PROJECT - II

IV-B.Tech.-II-Sem.

L T P C

Subject Code: EC-PRJ-421

- - 22 11

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3



Academic Regulations (R20)
B.Tech. - Regular Four Year Degree Programme (ECE)
(For batches admitted from the academic year 2019 - 20)
Department of Electronics and Communication Engineering

LINEAR ALGEBRA & CALCULUS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-101	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	analyze the nature of sequences and series	3	2	1
CO4	verify mean value theorems and evaluate improper integrals by using Beta and Gamma functions	3	2	1
CO5	find the extreme values of functions of two variables	3	2	1

APPLIED PHYSICS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-103	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the principles of Quantum Mechanics	3	2	1
CO2	analyze various electron theories of conduction in solids	3	2	1
CO3	classify semiconductors and relate functioning of semiconductor devices	3	2	1
CO4	illustrate principles and applications of lasers and optical fibers	3	2	1
CO5	outline dielectric and magnetic properties of materials	3	2	1

ENGLISH FOR ENGINEERS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-HSMC-101	2	-	-	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in RAWLS skills	3	1
CO2	demonstrate the acquired language in written and spoken contexts	3	1
CO3	express, restate and respond appropriately by comprehending the given data	3	1
CO4	develop proficiency to succeed in academic activities, research and career	3	1
CO5	excel in professional and social etiquette	3	1

PROBLEM SOLVING WITH C PROGRAMMING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-103	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

COMPUTER AIDED ENGINEERING GRAPHICS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-107	-	-	3	1.5



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2

APPLIED PHYSICS LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-104	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	demonstrate the electrical properties of a semiconductor	3
CO2	compare practical results with theoretical calculations in electrical circuits	3
CO3	demonstrate the properties of lasers and optical fibers	3
CO4	find the energy gap of a semiconductor and identify its band structure	3
CO5	examine electrical resonance in LCR circuits	3

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-HSMC-102	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	identify the nuances of the language through multimedia experience	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3
CO4	develop speaking and listening skills	3	3
CO5	appraise communication and correspond effectively	3	3

PROBLEM SOLVING WITH C PROGRAMMING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-104	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3
CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3

NATIONAL SERVICE SCHEME (NSS)/PHYSICAL EDUCATION/YOGA MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-MC-101	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO9	PO12
CO1	harness physical literacy and lifelong engagement	3	3	3	3	3
CO2	use aesthetic appreciation	2	1	2	3	3
CO3	build competence and confidence to face challenges	1	2	1	3	3



CO4	develop Sports related values and attitudes	3	3	2	2	3
CO5	follow appropriate etiquette and sports	1	1	2	3	3

ADVANCED CALCULUS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-102	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve linear and non-linear partial differential equations	3	2	1
CO3	evaluate the line, surface and volume integrals and convert them from one to another by using multiple integrals	3	2	1
CO4	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

ENGINEERING CHEMISTRY

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-105	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1
CO4	illustrate the various fuels, synthesis of polymers and drugs	3	2	1
CO5	analyze the properties of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-101	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	elaborate the concepts of network theorems & single phase AC circuits	3	3	2	1
CO3	explain three phase AC circuits and P-N Junction Diode	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1

DATA STRUCTURES THROUGH C

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-105	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	classify different data structures to design efficient programs	3	3	2	2
CO2	identify appropriate sorting and searching techniques	3	2	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	explain various concepts of non-linear data structures	3	3	2	2
CO5	choose an appropriate hashing technique for a given problem	3	3	2	2



ENGINEERING CHEMISTRY LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-106	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	determine the hardness in water samples to solve societal problems	3
CO2	estimate the strength of the given solutions	3
CO3	analyze adsorption and viscosity of various fluids	3
CO4	synthesize the various organic compounds used in medical industry	3
CO5	verify and understand the distribution coefficient	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-102	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws	3
CO2	evaluate network theorems	3
CO3	verify the V-I characteristics of various electronic devices	3
CO4	determine the efficiency of various rectifiers	3
CO5	illustrate the configurations of Bi-polar junction transistor	3

DATA STRUCTURES THROUGH C LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-106	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	implement various searching and sorting techniques	3
CO2	demonstrate basic operations of stack and queues using arrays and linked lists	3
CO3	apply stack data structure to solve various computing problems	3
CO4	demonstrate and apply different methods for traversing graphs	3
CO5	construct binary search tree	3

IT & ENGINEERING WORKSHOP PRACTICE

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-108	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	execute simple programs using Sci Lab	3	3	2	2
CO2	design programs using conditional statements and loops	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2



**ENVIRONMENTAL SCIENCE
MANDATORY COURSE (NON-CREDIT)**

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-MC-102	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2

NUMERICAL METHODS AND COMPLEX ANALYSIS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-BSC-203	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve transcendental, linear and non-linear equations with numerical methods	3	2	1
CO2	find the numerical solutions for 1 st order initial value problems and integrals	3	2	1
CO3	solve ODE by using Laplace transforms	3	2	1
CO4	analyze the complex functions with reference to their analyticity	3	2	1
CO5	expand complex functions using Taylor's, Laurent's and Residue theorems	3	2	1

NETWORKS AND MEASUREMENTS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-206	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	assess the parameters of two port networks	3	3	2	2	3
CO2	evaluate the transient analysis in electrical circuits	3	3	2	2	3
CO3	design resonant circuits and magnetic circuits	3	3	2	2	3
CO4	analyze various filters and DC bridges	3	3	2	2	3
CO5	determine unknown parameters of AC bridges	3	3	2	2	3

PROBABILITY THEORY & STOCHASTIC PROCESSES

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-207	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	apply the concepts of probability and random variables	3	3	2	3
CO2	evaluate the distribution and density functions of single random variables	3	3	2	3
CO3	solve the problems related to multiple random variables	3	3	2	3
CO4	analyze the stochastic process and its temporal characteristics	3	3	2	3
CO5	outline the spectral characteristics of stochastic process	3	3	2	3

ANALOG ELECTRONICS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-EC-PC-211	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	analyze single stage amplifiers at low frequencies	3	3	2	2	3
CO2	design multistage amplifiers at high frequencies using transistors	3	3	2	2	3
CO3	illustrate feedback amplifiers and oscillators	3	3	2	2	3
CO4	examine the power and tuned amplifiers	3	3	2	2	3
CO5	interpret various FET Amplifiers	3	3	2	2	3

SIGNALS AND SYSTEMS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-EC-PC-212	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	interpret various types of signals and systems	3	3	2	3
CO2	determine the convolution and correlation on various signals	3	3	2	3
CO3	evaluate signals using Fourier series and transforms	3	3	3	3
CO4	analyze sampling theorem and Z-transform	3	3	2	3
CO5	apply the mathematical modelling to LTI systems	3	3	3	3

ANALOG ELECTRONICS AND NETWORKS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-EC-PC-213	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	design and analyze the transistor amplifier circuits	3	3	3
CO2	design and analyze the FET amplifiers, feedback amplifiers and Oscillators	3	3	3
CO3	design and analyze the large signal amplifiers	3	3	3
CO4	design two port network and analyze transients for series circuits	3	3	3
CO5	evaluate filters & draw its characteristics	3	3	3

SIMULATION LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-EC-PC-214	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	interpret various types of MATLAB tools	3	3	3
CO2	solve different signals and perform different operations on signals	3	3	3
CO3	analyze convolution, correlation between signals and sequences	3	3	3
CO4	examine the stability of the system using S-plane and Z-plane	3	3	3
CO5	apply the mathematical modelling to LTI systems	3	3	3

BUSINESS COMMUNICATION SKILLS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-HSMC-201	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3
CO3	make use of soft skills to become a professional team member	3	3
CO4	apply knowledge of decision making, leadership, motivation	3	3
CO5	exhibit confidence in facing the interview process	3	3



SOCIAL INNOVATION LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-205	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	illustrate social innovation	3
CO2	identify the problems	3
CO3	choose suitable design processes	3
CO4	develop a prototype using suitable platform	3
CO5	prepare a report using project management techniques and ethics	3

GENDER SENSITIZATION LAB (MANDATORY COURSE- NON- CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-MC-201	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

PULSE & DIGITAL CIRCUITS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-EC-PC-221	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	design of linear wave shaping circuits for various applications	3	3	2	3
CO2	construct nonlinear wave shaping circuits	3	3	2	3
CO3	demonstrate the switching characteristics of diode and transistor	3	3	2	3
CO4	design and analyze multi-vibrator circuits and time-base generators	3	3	2	3
CO5	develop circuits using the concepts of sampling gates and logic families	3	3	2	3

LINEAR & DIGITAL IC APPLICATIONS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-EC-PC-222	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	describe various stages of operational amplifier	3	2	2	3
CO2	design active filters, PLL and 555 timers	3	3	2	3
CO3	analyze various ADCs and DACs	3	3	2	3
CO4	construct various combinational circuits using IC's	3	3	2	3
CO5	build various sequential circuits using IC's	3	3	2	3

DIGITAL DESIGN AND COMPUTER ORGANIZATION

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-EC-PC-223	3	-	-	3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	interpret number systems and codes	3	2	2	3
CO2	solve boolean expressions and analyze combinational circuits	3	3	3	3
CO3	design the sequential circuits	3	3	3	3
CO4	illustrate various micro operations	3	2	2	3
CO5	explain basics of various types of memories	3	2	2	3

ELECTROMAGNETIC WAVES & TRANSMISSION LINES

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-EC-PC-224	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	illustrate the concepts of electric fields	3	2	2	3
CO2	interpret the concepts of magnetic fields	3	2	2	3
CO3	outline the characteristics of electromagnetic fields	3	3	2	3
CO4	explain electromagnetic field concepts	3	3	2	3
CO5	summarize the fundamental concepts of transmission line theory	3	3	2	3

CONTROL SYSTEMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-EC-PC-225	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain mathematical models of control systems in continuous time	3	3	2
CO2	determine the transient and steady state performances of a control system	3	3	2
CO3	analyze the stability by using R-H criterion and root-locus concepts	3	3	2
CO4	evaluate the stability analysis in frequency domain	3	3	2
CO5	examine the controllability and observability of a system	3	3	2

PULSE & DIGITAL CIRCUITS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-EC-PC-226	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	design linear and non linear wave shaping circuits	3	3	3
CO2	analyze multivibrators and its applications	3	3	3
CO3	create oscillations and sweep signals using UJT and Boot strap circuits	3	3	3
CO4	illustrate the switching characteristics of transistor	3	3	3
CO5	demonstrate the operation of logic gates and sampling gates	3	3	3

LINEAR & DIGITAL IC APPLICATIONS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-EC-PC-227	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	construct circuits for various applications using Op-Amp IC741	3	3	3
CO2	design various applications with specific ICs	3	3	3
CO3	model various sequential and combinational circuits using digital ICs	3	3	3
CO4	design and analyze synchronous and asynchronous counters using digital ICs	3	3	3



CO5	implement the sequential circuits	3	3	3
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DIGITAL DESIGN LAB THROUGH VERILOG

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-EC-PC-228	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	examine basic logic gates	3	3	3
CO2	implement boolean functions using universal gates	3	3	3
CO3	construct various combinational logic circuits	3	3	3
CO4	analyze the operation of flip-flops	3	3	3
CO5	design registers and counters using flip-flops	3	3	3

APTITUDE AND CRITICAL THINKING SKILLS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-204	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	build proficiency in quantitative reasoning	3	3
CO2	improve critical thinking skills	3	3
CO3	enhance analytical skills	3	3
CO4	demonstrate quantitative aptitude concepts	3	3
CO5	adapt principles of quantitative aptitude to achieve qualitative results	3	3

INDIAN CULTURE AND CONSTITUTION MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-MC-202	3	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	3
CO2	explain features of languages, religions and holy books	3	3
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	3

ANALOG AND DIGITAL COMMUNICATION

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-EC-PC-311	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PSO1
CO1	analyze various analog modulation and demodulation schemes	3	3	2	2	3
CO2	explain various angle modulation and demodulation schemes	3	3	2	2	3
CO3	demonstrate AM, FM transmitters and receivers	3	3	2	2	3
CO4	distinguish pulse modulation and pulse code modulation schemes	3	3	2	2	3
CO5	illustrate digital modulation schemes and compute BER	3	3	2	2	3

ANTENNAS AND WAVE PROPAGATION

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-EC-PC-312	3	-	-	3

(Signature)

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	explain the radiation of electromagnetic waves from antennas	3	3	2	3
CO2	implement antenna arrays	3	3	2	3
CO3	design antennas at HF and VHF	3	3	3	3
CO4	analyze antennas at UHF and measure antenna parameters	3	3	3	3
CO5	identify the characteristics and effects on Radio Wave Propagation	3	3	2	3

DIGITAL SIGNAL PROCESSING

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-EC-PC-313	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	analyze discrete times signals in the time and frequency domains	3	3	2	3	3
CO2	implement DFT and FFT on time domain signals	3	3	2	3	3
CO3	design IIR filters using various techniques	3	3	2	3	3
CO4	design FIR filters using various techniques	3	3	2	3	3
CO5	illustrate Multirate Signal Processing	3	3	2	2	3

MICROPROCESSORS & MICROCONTROLLERS

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-EC-PC-314	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PSO1
CO1	illustrate the internal architecture and organization of 8086	3	3	2	2	3
CO2	analyze 8086 ALPs and interfacing devices	3	3	2	2	3
CO3	explain the architecture of 8051 microcontroller	3	3	2	3	3
CO4	interface memory, I/O and advanced peripherals with 8051	3	3	2	3	3
CO5	adapt the architecture and instruction set of ARM processor	3	3	2	3	3

**DATA COMMUNICATION & COMPUTER NETWORKS
(Professional Elective – I)**

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-EC-PE-311	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PSO1
CO1	explain basics of networking and physical layer	3	2	3
CO2	interpret protocols of data link layer	3	2	3
CO3	illustrate network layer and communication protocols	3	2	3
CO4	outline transport layer protocols	3	2	3
CO5	make use of various protocols of application layer	3	2	3

**INFORMATION THEORY & CODING
(Professional Elective – I)**

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-EC-PE-312	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PSO1
CO1	apply the concepts of information theory and entropy	3	3	2	2	3
CO2	explain communication channel models	3	3	2	2	3



CO3	analyze various channel coding techniques	3	3	2	2	3
CO4	design BCH codes	3	3	2	2	3
CO5	develop error control codes	3	3	2	2	3

DIGITAL MARKETING (Professional Elective – I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-EC-PE-313	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	outline the importance of digital marketing	2	1	2	3	3	3
CO2	use search engine optimization to achieve business goals	3	2	3	3	3	3
CO3	adapt social media for business promotion	3	3	3	3	3	3
CO4	identify link building techniques for content consideration	3	2	3	3	3	3
CO5	apply digital marketing techniques in real time applications	3	3	3	3	3	3

ANALOG AND DIGITAL COMMUNICATION LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-EC-PC-315	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	test analog modulation and demodulation techniques	3	3	3
CO2	demonstrate time and frequency division multiplexing	3	3	3
CO3	design the pulse modulation and demodulation techniques	3	3	3
CO4	compare PCM , DPCM and DM	3	3	3
CO5	classify digital modulation and demodulation waveforms	3	3	3

DIGITAL SIGNAL PROCESSING LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-EC-PC-316	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	classify various types of signals and perform linear operations on the signals	3	3	3
CO2	compute linear and circular convolution	3	3	3
CO3	analyze the principles of DIT FFT and DIF FFT algorithms	3	3	3
CO4	design digital IIR and FIR filter using various techniques	3	3	3
CO5	apply Multirate concepts in sampling rate conversion applications	3	3	3

MICROPROCESSORS & MICROCONTROLLERS LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-EC-PC-317	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	interpret programs for various problems using 8086 microprocessor	3	3	3
CO2	develop interfacing between 8086 microprocessor and various peripherals	3	3	3
CO3	compile programs on Microcontroller based systems	3	3	3
CO4	interface 8051 ports with various peripherals	3	3	3
CO5	design Microprocessor and Microcontroller based systems	3	3	3

SCRIPTING LANGUAGES LAB



Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-ESC-311	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5
CO1	distinguish various scripting languages	3	3	3	3
CO2	develop programs using shell script	3	3	3	3
CO3	create applications using PHP	3	3	3	3
CO4	build applications using perl	3	3	3	3
CO5	construct programs using python	3	3	3	3

SUMMER INTERNSHIP

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-EC-PR-311	-	-	-	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

**CODING SKILLS
MANDATORY COURSE (NON-CREDIT)**

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-MC-301	1	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO12
CO1	solve real world problems using C & DS	3	3	3	3	3
CO2	solve real world problems using DBMS	3	3	3	3	3
CO3	solve real world problems using Python	3	3	3	3	3
CO4	solve real world problems using Java, HTML, JavaScript	3	3	3	3	3
CO5	solve real world problems using any one emerging technology	3	3	3	3	3

IOT WITH CLOUD COMPUTING

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-EC-PC-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PSO1
CO1	explain the concepts of IoT	3	2	3	3	3	3
CO2	illustrate the foundations of IoT	3	2	3	3	3	3
CO3	adapt protocol and standards of IoT	3	3	3	3	3	3
CO4	outline the importance of cloud in IoT	3	3	3	3	3	3
CO5	make use of cloud in IoT enabled spaces	3	2	3	3	3	3

VLSI DESIGN

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-EC-PC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PSO1
CO1	interpret various MOS transistor fabrication techniques	3	2	3	3	3
CO2	illustrate operation and electrical characteristics of MOS transistor	3	2	2	3	3
CO3	discuss VLSI Design flow, Stick diagrams, layout, design rules	3	3	2	3	3
CO4	outline the concepts of MOS circuits	3	3	2	3	3
CO5	interpret scaling and various levels of CMOS testing	3	3	2	3	3

ARTIFICIAL INTELLIGENCE

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-EC-PC-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12	PSO1
CO1	explain the concepts of artificial intelligence	3	3	3	3	2	3
CO2	illustrate various search algorithms	3	3	3	3	2	3
CO3	adapt various probabilistic reasoning approaches	3	3	2	3	3	3
CO4	elaborate Markov decision process	3	3	2	3	2	3
CO5	perceive various reinforcement learning approaches	3	3	2	3	3	3

CELLULAR AND MOBILE COMMUNICATIONS (Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-EC-PE-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	demonstrate the performance criteria of cellular systems	3	2	2	3	3
CO2	identify various types of interference and frequency planning	3	2	2	3	3
CO3	illustrate cell coverage, cell site and mobile antennas	3	2	2	3	3
CO4	summarize frequency management and channel assignment	3	2	2	3	3
CO5	classify various multiple access and spread spectrum techniques	3	2	2	3	3

EMBEDDED SYSTEMS (Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-EC-PC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	analyze the basic concepts of embedded systems	3	2	2	2	3	3
CO2	illustrate typical embedded system	3	2	3	3	3	3
CO3	adapt the knowledge of interfacing in embedded domain	3	3	3	2	3	3
CO4	compile embedded systems programming	3	3	3	2	3	3
CO5	explain the various real time operating system concepts	3	2	3	2	3	3

DATA MINING AND DATA ANALYTICS (Professional Elective –II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-EC-PE-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	summarize fundamentals of data mining	3	2	2	2	2
CO2	illustrate various mining association rules	3	3	2	2	3
CO3	make use of classification and clustering techniques	3	3	3	2	3
CO4	outline various data analytics techniques	3	2	2	2	3



CO5	solve statistical problems using R programming	3	3	3	3	3
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DISASTER MANAGEMENT (Open Elective - I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

ROBOTICS (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2
CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate sensors for robot	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

JAVA PROGRAMMING (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-324	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	create packages and interfaces	3	2	3	3	2
CO4	build efficient code using multithreading and exception handling	3	2	3	3	2
CO5	design real-time applications using applets	3	2	3	3	2

(Signature)

IOT WITH CLOUD COMPUTING LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-EC-PC-324	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	identify various IoT devices	3	3	3
CO2	use IoT devices in various applications	3	3	3
CO3	develop automation work-flow in IoT enabled cloud environment	3	3	3
CO4	take part in practicing and monitoring remotely	3	3	3
CO5	make use of various IoT protocols in cloud	3	3	3

VLSI DESIGN LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-EC-PC-325	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	test logic gates	3	3	3
CO2	design combinational circuits	3	3	3
CO3	develop sequential circuits	3	3	3
CO4	analyze finite state machines	3	3	3
CO5	construct CMOS circuit schematics and their layouts	3	3	3

ARTIFICIAL INTELLIGENCE LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-EC-PC-326	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	illustrate various search techniques	3	3	3
CO2	solve real-time problems using graph theory	3	3	3
CO3	develop various games using AI techniques	3	3	3
CO4	adapt Bayesian probability model	3	3	3
CO5	design programs based on Markov decision process	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-HSMC-301	1	-	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3

HUMAN VALUES AND PROFESSIONAL ETHICS MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-MC-302	2	-	-	-



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO12
CO1	identify values and ethics and its relation to individual excellence	3	3	3	2
CO2	outline the ten commandments and try to apply in professional career	2	2	3	2
CO3	illustrate modern percepts of ethics, CSR and Corporate Governance	3	3	3	2
CO4	analyze the purpose of professional code of ethics and whistle blowing	3	3	3	2
CO5	practice student professional/technical societies/associations activities	3	3	3	3

BUSINESS ECONOMICS

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-HSMC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	outline the concepts of business management & economics	3	2
CO2	identify demand function to predict sales using linear regression	3	2
CO3	adapt production, price, market and cost analysis functions	3	2
CO4	estimate enterprise requirements under risky economic environment	2	3
CO5	assess the operational and financial performance of an enterprise	3	3

MICROWAVE ENGINEERING

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-EC-PC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	identify the need of microwaves and transmission line characteristics	3	2	2	3
CO2	analyze electromagnetic wave propagation and microwave components	3	3	2	3
CO3	explain the operation of various microwave tubes	3	2	2	3
CO4	determine measurement parameters using microwave equipments	3	3	2	3
CO5	develop microwave systems for various applications	3	3	2	3

DIGITAL IMAGE PROCESSING (Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-EC-PE-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO12	PSO1
CO1	explain image fundamentals and transforms	3	3	2	3
CO2	utilize image enhancement and color image processing techniques	3	3	2	3
CO3	make use of image restoration techniques and wavelets	3	3	2	3
CO4	apply image segmentation and morphological image processing	3	3	2	3
CO5	analyze image compression techniques	3	3	2	3

IOT ARCHITECTURE AND PROTOCOLS Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-EC-PC-413	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline the fundamentals of IoT architecture and smart objects	3	3	2	3	3	3
CO2	make use of smart objects in IoT	3	3	3	3	3	3
CO3	illustrate IoT reference architecture and ARM	3	2	3	3	3	3



CO4	demonstrate application protocols for IoT	3	3	3	3	3	3
CO5	apply IoT architecture and protocols for public safety	3	3	3	3	3	3

MACHINE LEARNING AND DATA SCIENCE
(Professional Elective - III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-EC-PC-415	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12
CO1	demonstrate the required mathematical foundations for ML& DS	3	3	3	3
CO2	outline the functionalities of machine learning	3	3	3	3
CO3	illustrate learning algorithms & data science basics	3	3	2	2
CO4	build data science applications using Python based toolkits	3	3	3	3
CO5	use recommender systems in real time applications	3	3	3	3

RADAR AND SATELLITE COMMUNICATION SYSTEMS
(Professional Elective – IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-EC-PE-412	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PSO1
CO1	explain the basic principles of radar system	3	2	2	2	3
CO2	illustrate the various types of radar systems	3	2	2	2	3
CO3	analyze radar signals and explain the principles of satellites	3	2	2	2	3
CO4	compare satellite subsystems with earth station technology	3	2	2	2	3
CO5	design the power budget for satellite links	3	2	2	2	3

SMART SENSORS AND NETWORKING
(Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-EC-PE-414	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of smart sensors	3	2	2	2	3	3
CO2	illustrate communication process	3	3	2	3	3	3
CO3	make use of various sensor nodes	3	3	3	3	3	3
CO4	adapt the standards of smart sensing	3	3	3	3	3	3
CO5	outline the implications of smart sensor standards	3	2	3	3	3	3

AUGMENTED AND VIRTUAL REALITY
(Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PE-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	illustrate taxonomy and features of AR systems	2	2	2	2	2	3
CO2	explain fundamentals of virtual reality	3	3	3	3	3	3
CO3	adapt geometric modeling in virtual reality environment	3	3	3	3	3	3
CO4	make use of virtual environment for animation	3	2	3	3	2	3
CO5	develop VR and AR applications	3	3	3	3	3	3



GREEN BUILDING TECHNOLOGIES (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO7	PO12
CO1	explain the fundamentals of energy use and processes in building	3	2	2	2
CO2	identify indoor environmental requirement and its management	3	3	3	2
CO3	assess the impact of solar radiation on buildings	3	3	3	2
CO4	evaluate end-use energy utilization and requirements	3	3	2	2
CO5	adapt audit procedures for energy management	3	3	3	2

DRONES (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-412	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO7	PO12
CO1	explain concepts of creative industries	3	3	3	3	3	3
CO2	outline the needs of creative industries	3	3	3	3	3	3
CO3	illustrate deployment and deadly abilities of drones	3	3	3	3	3	3
CO4	adapt price based data routing in dynamic IoT	3	3	3	3	3	3
CO5	make use of security in UAV/Drone communications	3	3	3	3	3	3

5G TECHNOLOGIES (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-413	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain basic principles of 5G communication	3	3	2	2	3	3	3
CO2	identify the 5G new radio, core network, mobile networks	3	3	2	2	3	3	3
CO3	analyze the physical architecture of 5G and its challenges	3	3	2	2	3	3	3
CO4	design the modulation and multiple access technique for 5G	3	3	2	2	3	3	3
CO5	evaluate the various channels, layers and links used in 5G	3	3	2	2	3	3	3

DATABASE MANAGEMENT SYSTEMS (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-414	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2



MICROWAVE ENGINEERING LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-EC-PC-412	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	interpret the characteristics of microwave devices	3	3	3
CO2	determine scattering parameters of various microwave components	3	3	3
CO3	analyze various parameters of waveguide components	3	3	3
CO4	measure VSWR and antenna pattern	3	3	3
CO5	design a microwave communication link using microwave bench	3	3	3

INDUSTRY ORIENTED MINI-PROJECT

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-EC-PR-411	-	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3

5G COMMUNICATION TECHNOLOGIES (Professional Elective -V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-EC-PE-421	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain basic principles of 5G communication	3	3	2	2	3	3	3
CO2	identify the 5G new radio, core network, mobile networks	3	3	2	2	3	3	3
CO3	analyze the physical architecture of 5G and its challenges	3	3	2	2	3	3	3
CO4	design the modulation and multiple access technique for 5G	3	3	2	2	3	3	3
CO5	evaluate the various channels, layers and links used in 5G	3	3	2	2	3	3	3

SOFTWARE DEFINED RADIO (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-EC-PE-423	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the architecture of SDR	2	2	3	2	3	3
CO2	illustrate various digital frequency converters and digital filters	2	3	3	2	3	3
CO3	summarize signal processing components for software radio	3	3	3	2	3	3
CO4	identify various smart antennas for software radio	3	3	3	2	3	3
CO5	outline various navigational systems	3	3	3	2	3	3

NEURAL NETWORKS AND DEEP LEARNING (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
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Subject Code	20-EC-PE-425	3	-	-	3
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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	illustrate the functionalities of Neural Networks and Learning process	3	3	2	3	3	3
CO2	analyze the single-layer and multi-layer perceptrons	3	3	3	3	3	3
CO3	interpret the deep feed forward networks along with regularization	3	3	3	3	3	3
CO4	demonstrate the convolutional neural networks in deep learning	3	3	3	3	3	3
CO5	outline the importance of autoencoders	3	2	2	3	3	3

**WIRELESS COMMUNICATIONS
(Professional Elective – VI)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-EC-PC-422	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the basic concepts of wireless sensor networks	3	2	2	2	2	3
CO2	illustrate various wireless sensor networks topologies	3	2	2	2	2	3
CO3	analyze routing and MAC protocols for WSN	3	3	3	3	2	3
CO4	outline transport layer protocols for Adhoc WSN	3	3	2	2	2	3
CO5	make use of security techniques, WSN platforms and tools	3	3	2	3	2	3

**INDUSTRY 4.0
(Professional Elective - VI)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-EC-PE-424	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain concepts of Industry 4.0	3	3	2	3	3	3
CO2	outline the architecture of Industry 4.0	3	3	2	3	3	3
CO3	make use of Industry 4.0 resources	3	3	3	3	3	3
CO4	illustrate the use of data rationalization	3	3	3	3	3	3
CO5	adapt secure Industry 4.0 in all the sectors	3	3	2	3	3	3

**INFORMATION AND CYBER SECURITY
(Professional Elective – VI)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-EC-PE-426	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain information and cyber security terminologies	2	2	2	3	2	3
CO2	identify various cyber offences	3	3	3	3	3	3
CO3	apply cryptography for security networks	3	3	3	3	3	3
CO4	use standards and cyber laws to enhance cyber security	3	3	3	3	3	3
CO5	illustrate the importance of security policies & IT Act	3	3	3	3	3	3

**INTELLECTUAL PROPERTY RIGHTS
(Open Elective-III)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-421	3	-	-	3

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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO8	PO12
CO1	outline basics of intellectual property law	3	3	3	3
CO2	identify the various trademarks	3	3	3	3
CO3	analyze patent and copy rights law	3	3	3	3
CO4	differentiate trade secret and unfair practice	3	2	3	2
CO5	summarize new developments in Intellectual Property Rights	3	3	3	3

**PRINCIPLES OF ENTREPRENEURSHIP
(Open Elective – III)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-422	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3

**PRECISION AGRICULTURE
(Open Elective – III)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-423	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO2
CO1	explain the concepts of precision agriculture	3	3	3	3	3	3
CO2	outline the components of precision agriculture	3	3	3	3	3	3
CO3	illustrate about tools technologies and sampling	3	3	3	3	3	3
CO4	adapt recent advances in precision agriculture	3	3	3	3	3	3
CO5	make use of feasibility and evaluation of precision farming	3	3	3	3	3	3

**WEB TECHNOLOGIES
(Open Elective – III)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-424	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2

MAJOR PROJECT

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-EC-PR-421	-	-	20	10

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the problem statement, assess the scope and develop a prototype	3

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CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3



Academic Regulations (R22)
B.Tech. - Regular Four Year Degree Programme (ECE)
(For batches admitted from the academic year 2022 - 23)
Department of Electronics and Communication Engineering

INDUCTION PROGRAM

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO9	PO10	PO12
CO1	acquaint with new learning environment and inculcate ethos	3	3	3	3
CO2	explore professional comfort, sensitization and group dynamics	3	3	3	3
CO3	promote healthy bonding, professional advancement and excellence	3	3	3	3
CO4	build relationship among members of academic community	3	3	3	3
CO5	provide a panoramic view of art of living and build one's character	3	3	3	3

MATRICES AND CALCULUS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22BS11	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	verify mean value theorems and evaluate improper integrals	3	2	1
CO4	find the extreme values of functions of several variables	3	2	1
CO5	evaluate multiple integrals and apply them to find areas and volumes	3	2	1

APPLIED PHYSICS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22BS12	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the principles of Quantum Physics and band theory of solids	3	2	1
CO2	classify semiconductors and relate functioning of semiconductor devices	3	2	1
CO3	outline the concepts of dielectric, magnetic and energy materials	3	2	1
CO4	use fabrication and characterization techniques of nano-materials	3	2	1
CO5	illustrate principles and applications of lasers and optical fibers	3	2	1

ENGLISH FOR SKILL ENHANCEMENT

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22HS11	2	-	-	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in LSRW skills	3	2
CO2	demonstrate the acquired language in written and spoken contexts	3	2
CO3	express, restate and respond appropriately by comprehending the given data	3	2
CO4	develop proficiency to succeed in academic activities, research and career	3	2
CO5	excel in professional and social etiquette	3	2



PROGRAMMING FOR PROBLEM SOLVING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22ES12	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data and file handling	3	3	2	2
CO5	implement various searching and sorting techniques in C programming	3	3	2	2

ELEMENTS OF ELECTRONICS & COMMUNICATION ENGINEERING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22ES14	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PO9	PO12
CO1	identify various electronics components	3	3	3	3	3	3	3
CO2	measure various parameters using electronics equipments	3	3	3	3	3	3	3
CO3	identify various gate modules, ICs	3	3	3	3	3	3	3
CO4	distinguish analog and digital communications signals	3	3	3	3	3	3	3
CO5	explain software's used in the field of electronics	3	3	3	3	3	3	3

APPLIED PHYSICS LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22BS13	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO9
CO1	calculate the Planck's constant, Hall co-efficient and Energy gap of semiconductors	3	3
CO2	examine the working of semiconductor and optoelectronic devices	3	3
CO3	demonstrate the behavior of magnetic and dielectric materials	3	3
CO4	demonstrate the properties of laser and optical fiber	3	3
CO5	compare practical results with theoretical calculations in electrical circuits	3	3

ENGLISH LANGUAGE LABORATORY FOR EFFECTIVE COMMUNICATION

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22HS12	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO9	PO10
CO1	identify the nuances of the language through multimedia experience	3	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3	3
CO4	develop speaking and listening skills	3	3	3
CO5	appraise communication and correspond effectively	3	3	3

PROGRAMMING FOR PROBLEM SOLVING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22ES16	-	-	2	1



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	execute simple programs using C compiler	3	3	3
CO2	apply control statements in designing programs	3	3	3
CO3	design programs using functions, arrays, strings and pointers	3	3	3
CO4	construct programs for heterogeneous data and file operations	3	3	3
CO5	implement various searching and sorting techniques in C programming	3	3	3

IT WORKSHOP PRACTICE

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22ES18	-	1	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	classify hardware components and inter dependencies	3	3	2	2
CO2	install operating systems and MS office	3	3	2	2
CO3	configure IP and trouble shoot network connections	3	3	3	2
CO4	use internet and safeguard computer systems from viruses/worms	3	3	3	2
CO5	prepare documentation/presentation by using office tools	3	3	3	2

ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22BS21	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	identify whether the given differential equation of first order is exact or not	3	2	1
CO2	solve ordinary differential equations of higher order	3	2	1
CO3	use the Laplace transforms techniques for solving ODE's	3	2	1
CO4	find vector differentiation of vector & scalar field/gradient/divergence/curl	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

ENGINEERING CHEMISTRY

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22BS24	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1
CO4	illustrate the various fuels, synthesis of polymers	3	2	1
CO5	analyze and understand the properties, applications of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22ES21	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	elaborate the concepts of network theorems & single phase AC circuits	3	3	2	1
CO3	explain three phase AC circuits and P-N Junction Diode	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1



CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1
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DATA STRUCTURES THROUGH PYTHON

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22ES22	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the fundamentals of python programming	3	3	2	2
CO2	develop programs using collections, classes and build error-free codes	3	3	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	make use of various concepts of non-linear data structures	3	3	3	2
CO5	design data structures using graphs	3	3	3	3

ENGINEERING CHEMISTRY LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22BS25	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO9
CO1	determine the hardness in water samples to solve societal problems	3	3
CO2	estimate the strength of the given solutions	3	3
CO3	determine surface tension, Acid value and viscosity of various fluids	3	3
CO4	analyze the rate of corrosion of mild steel in various conditions	3	3
CO5	verify and understand the distribution coefficient	3	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22ES23	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO9
CO1	design electrical circuits to verify circuit laws	3	3
CO2	evaluate network theorems	3	3
CO3	verify the V-I characteristics of various electronic devices	3	3
CO4	determine the efficiency of various rectifiers	3	3
CO5	illustrate the configurations of Bi-polar junction transistor	3	3

DATA STRUCTURES THROUGH PYTHON LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22ES24	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	write simple programs using python	3	3	3
CO2	develop programs using collections and classes	3	3	3
CO3	construct different linear data structures along with their operations	3	3	3
CO4	implement various search trees	3	3	3
CO5	design programs for traversing graphs	3	3	3

COMPUTER AIDED ENGINEERING GRAPHICS LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22ES25	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	3	3
CO2	construct conic sections using various methods	3	3	3	3
CO3	draw orthographic projections of points, lines, planes and solids	3	3	3	3
CO4	draw development of solid surfaces	3	3	3	3
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	3	3

DESIGN THINKING FOR INNOVATION AND STARTUPS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22ES27	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO12	PSO1	PSO2
CO1	illustrate the design thinking practices for value based innovation	3	3	3
CO2	analyze stakeholder behaviour and empathy in ideation	3	3	3
CO3	develop and test prototype for its scalability	3	3	3
CO4	identify and standardize business process	3	3	3
CO5	prepare a startup pitch	3	3	3

ENVIRONMENTAL SCIENCE & DISASTER MANAGEMENT MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22MC21	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	explain the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	identify solutions for sustainable development and pollution control	3	3	3	2
CO4	analyze various types of disasters	3	3	3	3
CO5	develop strategies for preparedness measures against disasters	3	3	3	2

NUMERICAL METHODS AND COMPLEX VARIABLES

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22BS32	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	express any periodic function in terms of sine and cosine terms	3	2	1
CO2	estimate the value for the given data using interpolation	3	2	1
CO3	find the numerical solutions for a given first order ODE's	3	2	1
CO4	analyze the complex functions with reference to their analyticity	3	2	1
CO5	expand complex functions using Taylor's, Laurent's and Residue theorems	3	2	1

PROBABILITY THEORY & STOCHASTIC PROCESSES

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22ES31	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	apply the concepts of probability and random variables	3	3	2	3
CO2	evaluate the distribution and density functions of single random variables	3	3	2	3
CO3	solve the problems related to multiple random variables	3	3	2	3
CO4	analyze the stochastic process and its temporal characteristics	3	3	2	3
CO5	outline the spectral characteristics of stochastic process	3	3	2	3

(Signature)

DIGITAL LOGIC DESIGN

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22ECPC31	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	interpret number systems and boolean algebra	3	3	2	2	2
CO2	use Karnaugh Map for minimization of boolean functions	3	3	2	2	3
CO3	construct combinational circuits & sequential logic circuits	3	3	2	2	2
CO4	design sequential circuits for registers and counters	3	3	2	2	3
CO5	illustrate finite state machine	3	3	2	2	3

ANALOG ELECTRONICS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22ECPC32	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	analyze single stage amplifiers at low frequencies	3	3	2	2	3
CO2	design multistage amplifiers at high frequencies using transistors	3	3	2	2	3
CO3	illustrate feedback amplifiers and oscillators	3	3	2	2	3
CO4	examine the power and tuned amplifiers	3	3	2	2	3
CO5	interpret various FET Amplifiers	3	3	2	2	3

SIGNALS AND SYSTEMS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22ECPC33	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	interpret various types of signals and systems	3	3	2	3
CO2	determine the convolution and correlation on various signals	3	3	2	3
CO3	evaluate signals using Fourier series and transforms	3	3	3	3
CO4	analyze sampling theorem and Z-transform	3	3	2	3
CO5	apply the mathematical modelling to LTI systems	3	3	3	3

DIGITAL LOGIC DESIGN LAB THROUGH VERILOG HDL

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22ECPC34	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	examine basic logic gates	3	3	3	3
CO2	implement boolean functions using universal gates	3	3	3	3
CO3	construct various combinational logic circuits	3	3	3	3
CO4	analyze the operation of flip-flops	3	3	3	3
CO5	design registers and counters using flip-flops	3	3	3	3

ANALOG ELECTRONICS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22ECPC35	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	design and analyze the transistor amplifier circuits	3	3	3	3
CO2	design and analyze the FET amplifiers	3	3	3	3
CO3	design and analyze the feedback amplifiers	3	3	3	3
CO4	design and analyze the Oscillators	3	3	3	3
CO5	design and analyze the large signal amplifiers	3	3	3	3

SIMULATION LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22ECPC36	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	interpret various types of MATLAB tools	3	3	3	3
CO2	solve different signals and perform different operations on signals	3	3	3	3
CO3	analyze convolution, correlation between signals and sequences	3	3	3	3
CO4	examine the stability of the system using S-plane and Z-plane	3	3	3	3
CO5	apply the mathematical modelling to LTI systems	3	3	3	3

SCRIPTING LANGUAGES LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22ES33	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO9
CO1	distinguish various scripting languages	3	3	3	3	3
CO2	develop programs using shell script	3	3	3	3	3
CO3	create applications using PHP	3	3	3	3	3
CO4	build applications using Perl	3	3	3	3	3
CO5	construct programs using JavaScript	3	3	3	3	3

GENDER SENSITIZATION (MANDATORY COURSE - NON-CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22MC31	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

EMPLOYABILITY SKILLS – I (MANDATORY COURSE (NON-CREDIT))

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22MC32	-	-	3	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3
CO3	build proficiency in quantitative reasoning	3	3



CO4	improve critical thinking skills	3	3
CO5	exhibit confidence in facing the interview process	3	3

NETWORKS AND CONTROL SYSTEMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22ECPC41	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	assess the parameters of two port networks	3	3	2	2	3
CO2	evaluate the transient analysis in electrical circuits	3	3	2	2	3
CO3	analyze the transfer function and stability using R-H criterion	3	3	2	2	3
CO4	determine transient and steady state analysis of a control system	3	3	2	2	3
CO5	examine the stability analysis in frequency domain	3	3	2	2	3

PULSE & DIGITAL CIRCUITS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22ECPC42	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	design of linear wave shaping circuits for various applications	3	3	2	3
CO2	construct nonlinear wave shaping circuits	3	3	2	3
CO3	demonstrate the switching characteristics of diode and transistor	3	3	2	3
CO4	design and analyze multi-vibrator circuits and time-base generators	3	3	2	3
CO5	develop circuits using the concepts of sampling gates and logic families	3	3	2	3

LINEAR & DIGITAL IC APPLICATIONS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22ECPC43	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	describe various stages of operational amplifier	3	2	2	3
CO2	design active filters, PLL and 555 timers	3	3	2	3
CO3	analyze various ADCs and DACs	3	3	2	3
CO4	construct various combinational circuits using IC's	3	3	2	3
CO5	build various sequential circuits using IC's	3	3	2	3

ELECTROMAGNETIC WAVES & TRANSMISSION LINES

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22ECPC44	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	illustrate the concepts of electric fields	3	2	2	3
CO2	interpret the concepts of magnetic fields	3	2	2	3
CO3	outline the characteristics of electromagnetic fields	3	3	2	3
CO4	explain electromagnetic field concepts	3	3	2	3
CO5	summarize the fundamental concepts of transmission line theory	3	3	2	3

DATABASE MANAGEMENT SYSTEMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22ECPC45	3	-	-	3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design simple databases using database architectures	3	3	3	2
CO2	construct databases using ER Modelling	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	2
CO4	apply normalization on database to eliminate redundancy	3	3	3	2
CO5	explain transaction processing and concurrency control	3	3	3	2

PULSE & DIGITAL CIRCUITS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22ECPC46	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	design linear and non linear wave shaping circuits	3	3	3	3
CO2	analyze multivibrators and its applications	3	3	3	3
CO3	create oscillations and sweep signals using UJT and Boot strap circuits	3	3	3	3
CO4	illustrate the switching characteristics of transistor	3	3	3	3
CO5	demonstrate the operation of logic gates and sampling gates	3	3	3	3

LINEAR & DIGITAL IC APPLICATIONS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22ECPC47	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	construct circuits for various applications using Op-Amp IC741	3	3	3	3
CO2	design various applications with specific ICs	3	3	3	3
CO3	model various sequential and combinational circuits using digital ICs	3	3	3	3
CO4	design and analyze synchronous and asynchronous counters using digital ICs	3	3	3	3
CO5	implement the sequential circuits	3	3	3	3

DATABASE MANAGEMENT SYSTEMS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22ECPC48	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	construct databases using SQL commands	3	3	3
CO2	apply normalization techniques to eliminate redundancy	3	3	3
CO3	design a database schema for a given domain	3	3	3
CO4	solve queries based on joins, nested queries and aggregate functions	3	3	3
CO5	execute PL/SQL programs for a given application	3	3	3

REAL TIME/SOCIETAL RESEARCH PROJECT

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22ECPR41	-	-	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify relevant problem and design & develop a prototype	3
CO2	execute project using modern tools and prepare the report	3
CO3	exhibit leadership and managerial skills in project development	3



CO4	function effectively as individual, member and/or leader in project teams	3
CO5	apply engineering knowledge for societal sustenance	3

INDIAN CULTURE AND CONSTITUTION MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22MC41	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	1
CO2	explain features of languages, religions and holy books	3	2
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	2

EMPLOYABILITY SKILLS – II MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22MC42	-	-	3	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	make use of soft skills to become a professional team member	3	3
CO2	develop professional correspondence skills	3	3
CO3	apply knowledge of decision making, leadership, motivation	3	3
CO4	adapt principles of quantitative aptitude to achieve qualitative results	3	3
CO5	exhibit confidence in facing the interview process	3	3

ANALOG AND DIGITAL COMMUNICATION

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22ECPC51	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PSO1
CO1	analyze various analog modulation and demodulation schemes	3	3	2	2	3
CO2	explain various angle modulation and demodulation schemes	3	3	2	2	3
CO3	demonstrate AM, FM transmitters and receivers	3	3	2	2	3
CO4	distinguish pulse modulation and pulse code modulation schemes	3	3	2	2	3
CO5	illustrate digital modulation schemes and compute BER	3	3	2	2	3

ANTENNAS AND WAVE PROPAGATION

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22ECPC52	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	explain the radiation of electromagnetic waves from antennas	3	3	2	3
CO2	implement antenna arrays	3	3	2	3
CO3	design antennas at HF and VHF	3	3	3	3
CO4	analyze antennas at UHF and measure antenna parameters	3	3	3	3
CO5	identify the characteristics and effects on Radio Wave Propagation	3	3	2	3



MICROPROCESSORS & MICROCONTROLLERS

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22ECPC53	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PSO1
CO1	illustrate the architecture and ALP of 8086 processor	3	3	2	2	3
CO2	explain the architecture of 8051 microcontroller	3	3	2	2	3
CO3	interface memory, I/O and advanced peripherals with 8051	3	3	2	3	3
CO4	adapt the architecture and instruction set of ARM processor	3	3	2	3	3
CO5	demonstrate advanced ARM processors	3	3	2	3	3

OOP THROUGH JAVA

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22ECPC54	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple java programs using OOP concepts	3	3	2	2
CO2	interpret programs using OOP concepts	3	3	2	2
CO3	build efficient codes using multithreading and exception handling	3	3	3	3
CO4	design GUI programs using AWT and event handling	3	3	3	2
CO5	develop real-time applications using applets and swings	3	3	3	3

DATA COMMUNICATION & COMPUTER NETWORKS (Professional Elective – I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22ECPE51	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PSO1
CO1	explain basics of networking and physical layer	3	2	3
CO2	interpret protocols of data link layer	3	2	3
CO3	illustrate network layer and communication protocols	3	2	3
CO4	outline transport layer protocols	3	2	3
CO5	make use of various protocols of application layer	3	2	3

COMPUTER ORGANIZATION & OPERATING SYSTEMS (Professional Elective – I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22ECPE52	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	outline the basic structure of computer and its micro operations	3	2	2	3
CO2	explain the concepts of micro programmed control and memory system	3	2	3	3
CO3	make use of input-output organization and operating systems	3	3	3	3
CO4	illustrate Process and Memory Management of operating systems	3	3	3	3
CO5	adapt various deadlock handling and file management system	3	3	3	3

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (Professional Elective – I)

Course	B.Tech.-V-Sem.	L	T	P	C
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Subject Code	22ECPE53	3	-	-	3
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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO12	PSO1
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

**DIGITAL MARKETING
(Professional Elective – I)**

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22ECPE54	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	outline the importance of digital marketing	2	1	2	3	3	3
CO2	use search engine optimization to achieve business goals	3	2	3	3	3	3
CO3	adapt social media for business promotion	3	3	3	3	3	3
CO4	identify and register a domain	3	2	3	3	3	3
CO5	apply digital marketing techniques in real time applications	3	3	3	3	3	3

ANALOG AND DIGITAL COMMUNICATION LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22ECPC55	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	test analog modulation and demodulation techniques	3	3	3	3
CO2	demonstrate time and frequency division multiplexing	3	3	3	3
CO3	design the pulse modulation and demodulation techniques	3	3	3	3
CO4	compare PCM , DPCM and DM	3	3	3	3
CO5	classify digital modulation and demodulation waveforms	3	3	3	3

MICROPROCESSORS & MICROCONTROLLERS LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22ECPC56	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	interpret programs for various problems using 8086 microprocessor	3	3	3	3
CO2	develop interfacing between 8086 microprocessor and various peripherals	3	3	3	3
CO3	compile programs on Microcontroller based systems	3	3	3	3
CO4	interface 8051 ports with various peripherals	3	3	3	3
CO5	design Microprocessor and Microcontroller based systems	3	3	3	3

OOP THROUGH JAVA LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22ECPC47	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	write, compile and execute simple java programs	3	3	3



CO2	develop programs using inheritance, polymorphism, packages and Interfaces	3	3	3
CO3	demonstrate multithreading and exception handling mechanisms	3	3	3
CO4	design GUI using the concepts of AWT and event handling	3	3	3
CO5	build real-time applications using applets and swings	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22HS51	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO9	PO10
CO1	assess and utilize vocabulary in an effective way	3	3	3
CO2	interpret interpersonal relationships	3	3	3
CO3	elaborate academic reading and writing skills	3	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3	3

ENVIRONMENTAL SCIENCE & DISASTER MANAGEMENT MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22MC51*	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	explain the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	identify solutions for sustainable development and pollution control	3	3	3	2
CO4	analyze various types of disasters	3	3	3	3
CO5	develop strategies for preparedness measures against disasters	3	3	3	2

IOT AND CLOUD COMPUTING

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22ECPC61	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PSO1
CO1	explain the concepts of IoT	3	2	3	3	3	3
CO2	illustrate the foundations of IoT	3	2	3	3	3	3
CO3	adapt protocol and standards of IoT	3	3	3	3	3	3
CO4	outline the importance of cloud in IoT	3	3	3	3	3	3
CO5	make use of cloud in IoT enabled spaces	3	2	3	3	3	3

VLSI DESIGN

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22ECPC62	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PSO1
CO1	interpret various MOS transistor fabrication techniques	3	2	3	3	3
CO2	illustrate operation and electrical characteristics of MOS transistor	3	2	2	3	3
CO3	discuss VLSI Design flow, Stick diagrams, layout, design rules	3	3	2	3	3
CO4	outline the concepts of MOS circuits	3	3	2	3	3
CO5	interpret scaling and various levels of CMOS testing	3	3	2	3	3



DIGITAL SIGNAL PROCESSING

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22ECPC63	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	analyze discrete times signals in the time and frequency domains	3	3	2	3	3
CO2	implement DFT and FFT on time domain signals	3	3	2	3	3
CO3	design IIR filters using various techniques	3	3	2	3	3
CO4	design FIR filters using various techniques	3	3	2	3	3
CO5	illustrate Multirate Signal Processing	3	3	2	2	3

CELLULAR AND MOBILE COMMUNICATIONS (Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22ECPE61	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	demonstrate the performance criteria of cellular systems	3	2	2	3	3
CO2	identify various types of interference and frequency planning	3	2	2	3	3
CO3	illustrate cell coverage, cell site and mobile antennas	3	2	2	3	3
CO4	summarize frequency management and channel assignment	3	2	2	3	3
CO5	classify various multiple access and spread spectrum techniques	3	2	2	3	3

INFORMATION THEORY & CODING (Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22ECPE62	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PSO1
CO1	apply the concepts of information theory and entropy	3	3	2	2	3
CO2	explain communication channel models	3	3	2	2	3
CO3	analyze various channel coding techniques	3	3	2	2	3
CO4	design BCH codes	3	3	2	2	3
CO5	develop error control codes	3	3	2	2	3

EMBEDDED SYSTEM DESIGN (Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22ECPE63	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	analyze the basic concepts of embedded systems	3	2	2	2	3	3
CO2	illustrate typical embedded system	3	2	3	3	3	3
CO3	adapt embedded firmware approaches	3	3	3	2	3	3
CO4	explain the various real time operating system concepts	3	3	3	2	3	3
CO5	apply task communication and synchronization techniques	3	2	3	2	3	3

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING (Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
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Subject Code	22ECPE64	3	-	-	3
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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12	PSO1
CO1	illustrate the concepts of AI and various search algorithms	3	3	3	3	3	3
CO2	adapt knowledge representation and probabilistic reasoning	3	3	3	3	2	3
CO3	explain expert systems and concepts of machine learning	3	3	2	3	3	3
CO4	classify various supervised learning algorithms	3	3	2	3	2	3
CO5	demonstrate the various unsupervised learning algorithms	3	3	2	3	3	3

**E-COMMERCE
(Open Elective - I)**

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22OE61	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO8	PO9	PO10	PO12
CO1	outline the concepts of E-Commerce	3	2	2	3	3
CO2	develop supporting environment for E-Commerce	3	2	3	3	3
CO3	make use of technology in E-Commerce	3	3	3	3	3
CO4	adapt payment technologies in E-Commerce	3	3	3	3	3
CO5	implement security in E-Commerce	3	3	3	3	3

**AGILE METHODOLOGIES
(Open Elective - I)**

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22OE62	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12
CO1	explain the concepts of agile methodology	3	2	3	3	3
CO2	make use of agile process	3	3	3	3	3
CO3	illustrate agility and knowledge management	3	3	3	3	3
CO4	adapt agility and requirements engineering	3	3	3	3	3
CO5	outline the importance agility and quality assurance	3	2	3	3	3

**ELECTRONIC SENSORS
(Open Elective-I)**

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22OE63	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO8	PO12
CO1	analyze the characterization of sensors	3	3	2	2	3	3
CO2	illustrate thermal embedded system	3	2	3	3	3	3
CO3	adapt magnetic sensors	3	3	3	2	3	3
CO4	make use of radiation sensors	3	3	3	2	3	3
CO5	design a system with sensors	3	2	3	2	3	3

IOT AND CLOUD COMPUTING LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22ECPC64	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	identify various IoT devices	3	3	3	3



CO2	use IoT devices in various applications	3	3	3	3
CO3	develop automation work-flow in IoT enabled cloud environment	3	3	3	3
CO4	take part in practicing and monitoring remotely	3	3	3	3
CO5	make use of various IoT protocols in cloud	3	3	3	3

VLSI DESIGN LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22ECPC65	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	test logic gates	3	3	3	3
CO2	design combinational circuits	3	3	3	3
CO3	develop sequential circuits	3	3	3	3
CO4	analyze finite state machines	3	3	3	3
CO5	construct CMOS circuit schematics and their layouts	3	3	3	3

DIGITAL SIGNAL PROCESSING LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22ECPC66	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	classify various types of signals and perform linear operations on the signals	3	3	3	3
CO2	compute linear and circular convolution	3	3	3	3
CO3	analyze the principles of DIT FFT and DIF FFT algorithms	3	3	3	3
CO4	design digital IIR and FIR filter using various techniques	3	3	3	3
CO5	apply Multirate concepts in sampling rate conversion applications	3	3	3	3

INDUSTRY ORIENTED MINI PROJECT/INTERNSHIP/SKILL ENHANCEMENT COURSE – ROBOTIC PROCESS AUTOMATION

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22ECPR61	-	-	4	2

INDUSTRY ORIENTED MINI PROJECT/INTERNSHIP

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO1
CO1	apply domain knowledge to solve identified industrial problem	3
CO2	use industrial processes involved in end product/service	3
CO3	exhibit communication skills, professional ethics and social responsibility	3
CO4	manage and lead project in coordination with functional team-members	3
CO5	execute the project that meets industry requirements	3

SKILLS ENHANCEMENT COURSE- ROBOTIC PROCESS AUTOMATION

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22ECPR61	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	install RPA packages	3	3	3	3
CO2	apply variables, data types, control statements in designing RPA	3	3	3	3
CO3	make use of data manipulation, recording and scrapping techniques	3	3	3	3
CO4	use selectors, data tables in excel for automation	3	3	3	3
CO5	develop email and PDF automation	3	3	3	3

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**ENTREPRENEURSHIP AND IPR
MANDATORY COURSE (NON-CREDIT)**

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22MC61	3	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO7	PO8	PO12
CO1	illustrate entrepreneurship principles	3	3	3	3
CO2	analyze entrepreneurs' mindset	3	3	3	3
CO3	develop Business Plan and incubate innovative ideas	3	3	3	3
CO4	identify entrepreneurs' challenges in light of legal environment	3	2	3	2
CO5	demonstrate various types of IPRs applicable	3	3	3	3

MANAGEMENT, ECONOMICS AND ACCOUNTANCY

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22HS71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	apply principles of management in professional career	3	2
CO2	make use of principles of economics for decision making	3	2
CO3	solve problems in the areas of production, cost and price	3	2
CO4	prepare balance sheet and maintain books of accounts	2	3
CO5	analyze financial performance of an enterprise	3	3

MICROWAVE ENGINEERING

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22ECPC71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	identify the need of microwaves and transmission line characteristics	3	2	2	3
CO2	analyze electromagnetic wave propagation and microwave components	3	3	2	3
CO3	explain the operation of various microwave tubes	3	2	2	3
CO4	determine measurement parameters using microwave equipments	3	3	2	3
CO5	develop microwave systems for various applications	3	3	2	3

**DIGITAL IMAGE PROCESSING
(Professional Elective – III)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22ECPE71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO12	PSO1
CO1	explain image fundamentals and transforms	3	3	2	3
CO2	utilize image enhancement and filtering techniques	3	3	2	3
CO3	make use of image restoration techniques and color image processing	3	3	2	3
CO4	apply image segmentation and morphological image processing	3	3	2	3
CO5	analyze image compression techniques	3	3	2	3



IOT ARCHITECTURE AND PROTOCOLS (Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22ECPE72	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline the fundamentals of IoT architecture and smart objects	3	3	2	3	3	3
CO2	make use of smart objects in IoT	3	3	3	3	3	3
CO3	illustrate IoT reference architecture and ARM	3	2	3	3	3	3
CO4	demonstrate application protocols for IoT	3	3	3	3	3	3
CO5	apply IoT architecture and protocols for public safety	3	3	3	3	3	3

CMOS ANALOG IC DESIGN (Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22ECPE73	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	design basic building blocks of CMOS analog ICs	3	3	2	3	3	3
CO2	explain various analog CMOS Sub-Circuits	3	3	3	3	3	3
CO3	illustrate functions of MOS amplifiers	3	2	3	3	3	3
CO4	adapt various measurement techniques for Op Amps	3	3	3	3	3	3
CO5	outline various comparators	3	3	3	3	3	3

DATA MINING AND DATA ANALYTICS (Professional Elective - III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22ECPE74	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	summarize fundamentals of data mining	3	2	3	3	2
CO2	illustrate various mining association rules	3	3	2	2	3
CO3	make use of classification and clustering techniques	3	3	3	2	3
CO4	outline various data analytics techniques	3	2	2	2	3
CO5	solve statistical problems using R programming	3	3	3	3	3

RADAR AND SATELLITE COMMUNICATION SYSTEMS (Professional Elective – IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22ECPE75	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO7	PO12	PSO1
CO1	explain the basic principles of radar system	3	2	2	2	3
CO2	illustrate the various types of radar systems	3	2	2	2	3
CO3	analyze radar signals and explain the principles of satellites	3	2	2	2	3
CO4	compare satellite subsystems with earth station technology	3	2	2	2	3
CO5	design the power budget for satellite links	3	2	2	2	3



SMART SENSORS AND NETWORKING (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22ECPE76	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of smart sensors	3	2	2	2	3	3
CO2	illustrate communication process	3	3	2	3	3	3
CO3	make use of various sensor nodes	3	3	3	3	3	3
CO4	adapt the standards of smart sensing	3	3	3	3	3	3
CO5	outline the implications of smart sensor standards	3	2	3	3	3	3

APPLICATION SPECIFIC INTEGRATED CIRCUITS (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22ECPE77	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PSO1
CO1	explain various types of ASICs and its libraries	3	2	2	3	3
CO2	illustrate programmable ASICs and logic cells	3	3	2	3	3
CO3	make use of I/O cells, interconnects and programmable ASICs	3	3	3	3	3
CO4	summarize low level design entry and logic synthesis	3	3	3	3	3
CO5	design ASICs using various techniques	3	2	3	3	3

NEURAL NETWORKS AND DEEP LEARNING (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22ECPE78	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	illustrate the functionalities of neural networks	3	3	2	3	3	3
CO2	analyze the single-layer and multi-layer perceptrons	3	3	3	3	3	3
CO3	interpret deep feed forward networks with regularization	3	3	3	3	3	3
CO4	demonstrate convolutional neural networks in deep learning	3	3	3	3	3	3
CO5	outline the importance of autoencoders	3	2	2	3	3	3

CHATBOTS (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22OE71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO8	PO12
CO1	summarize chatbots and growth of internet	3	3	3	3	3	3
CO2	explain basics of bot building	3	3	3	3	3	3
CO3	articulate easy and hard ways of bot building	3	2	3	3	3	3
CO4	take part in deploying chatbot on apps	3	2	3	3	3	3
CO5	plan the deployment of chatbot	3	2	3	3	3	3



MULTIMEDIA AND ANIMATION (Open Elective – II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22OE72	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	explain the concepts of multimedia	3	3	3	3	3	3
CO2	outline the concepts of animation	3	3	3	3	3	3
CO3	make use of 2D and 3D animation concepts	3	2	3	3	3	2
CO4	develop motion caption using animation techniques	3	2	3	3	3	2
CO5	build concept development using animation techniques	3	2	3	3	3	2

EMBEDDED SYSTEMS (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22OE73	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO7	PO12
CO1	analyze the basic concepts of embedded systems	3	2	2	2	3	3
CO2	illustrate typical embedded system	3	2	3	3	3	3
CO3	adapt the knowledge of interfacing in embedded domain	3	3	3	2	3	3
CO4	compile embedded systems programming	3	3	3	2	3	3
CO5	explain the various real time operating system concepts	3	2	3	2	3	3

MICROWAVE ENGINEERING LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22ECPC72	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	interpret the characteristics of microwave devices	3	3	3	3
CO2	determine scattering parameters of various microwave components	3	3	3	3
CO3	analyze various parameters of waveguide components	3	3	3	3
CO4	measure VSWR and antenna pattern	3	3	3	3
CO5	design a microwave communication link using microwave bench	3	3	3	3

PROFESSIONAL PRACTICE, LAW & ETHICS LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22HS71	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO10	PO12
CO1	identify code of ethics and professional responsibilities	3	3	3	3	3
CO2	illustrate law of contract and legality of object	3	3	3	3	3
CO3	outline salient features of sale of goods act and agency law	3	3	3	3	3
CO4	assess the process for arbitration, adjudication and conciliation	3	3	3	3	3
CO5	apply legal provisions for cyber & environmental protection laws	3	3	3	3	3



PROJECT STAGE - I

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22ECPR71	-	-	6	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the real-world complex problems and set of objectives	3
CO2	review relevant literature from various sources	3
CO3	compile data and propose suitable tools and techniques	3
CO4	prepare an abstract of the proposed project	3
CO5	apply core competence to propose economically feasible solutions	3

5G COMMUNICATION TECHNOLOGIES (Professional Elective -V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22ECPE81	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain basic principles of 5G communication	3	3	2	2	3	3	3
CO2	identify the 5G new radio, core network, mobile networks	3	3	2	2	3	3	3
CO3	analyze the physical architecture of 5G and its challenges	3	3	2	2	3	3	3
CO4	design the modulation and multiple access technique for 5G	3	3	2	2	3	3	3
CO5	evaluate the various channels, layers and links used in 5G	3	3	2	2	3	3	3

SOFTWARE DEFINED RADIO (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22ECPE82	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the architecture of SDR	2	2	3	2	3	3
CO2	illustrate various digital frequency converters and digital filters	2	3	3	2	3	3
CO3	summarize signal processing components for software radio	3	3	3	2	3	3
CO4	identify various smart antennas for software radio	3	3	3	2	3	3
CO5	outline various navigational systems	3	3	3	2	3	3

LOW POWER VLSI DESIGN (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22ECPE83	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO12	PSO1
CO1	explain the concepts of low-power design	2	2	3	2	3	3
CO2	design low-voltage and low-power circuits	2	3	3	2	3	3
CO3	apply low power design techniques	3	3	3	2	3	3
CO4	develop low-voltage low power adders and multipliers	3	3	3	2	3	3
CO5	evaluate low-voltage low-power memories	3	3	3	2	3	3



AUGMENTED AND VIRTUAL REALITY (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22ECPE84	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	illustrate taxonomy and features of AR systems	2	2	2	2	2	3
CO2	explain fundamentals of virtual reality	3	3	3	3	3	3
CO3	adapt geometric modeling in virtual reality environment	3	3	3	3	3	3
CO4	make use of virtual environment for animation	3	2	3	3	2	3
CO5	develop VR and AR applications	3	3	3	3	3	3

AD-HOC WIRELESS SENSOR NETWORKS (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22ECPC85	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the basic concepts of wireless sensor networks	3	2	2	2	2	3
CO2	illustrate various wireless sensor networks topologies	3	2	2	2	2	3
CO3	analyze routing and MAC protocols for WSN	3	3	3	3	2	3
CO4	outline transport layer protocols for Ad-hoc WSN	3	3	2	2	2	3
CO5	make use of security techniques, WSN platforms and tools	3	3	2	3	2	3

INDUSTRY 4.0 (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22ECPE86	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain concepts of Industry 4.0	3	3	2	3	3	3
CO2	outline the architecture of Industry 4.0	3	3	2	3	3	3
CO3	make use of Industry 4.0 resources	3	3	3	3	3	3
CO4	illustrate the use of data rationalization	3	3	3	3	3	3
CO5	adapt secure Industry 4.0 in all the sectors	3	3	2	3	3	3

SYSTEM ON CHIP ARCHITECTURE (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22ECPE87	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of SOC Architectural features	3	2	2	2	3	3
CO2	illustrate processor selection criteria and limitations	3	3	2	3	3	3
CO3	make use of memory architectures on SOC	3	3	3	3	3	3
CO4	adapt the interconnection strategies on SOC	3	3	3	3	3	3
CO5	outline the customization on SOC	3	2	3	3	3	3

INFORMATION AND CYBER SECURITY (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
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Subject Code	22ECPE88	3	-	-	3
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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain information and cyber security terminologies	2	2	2	3	2	3
CO2	apply cryptography for security networks	3	3	3	3	3	3
CO3	identify various cyber offences	3	3	3	3	3	3
CO4	use standards and cyber laws to enhance cyber security	3	3	3	3	3	3
CO5	illustrate the importance of security policies & IT Act	3	3	3	3	3	3

**GAME DEVELOPMENT
(Open Elective – III)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22OE81	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO4	PO5	PO8	PO12
CO1	summarize game design concepts	3	3	2	3	2
CO2	explain basics of game & play	3	3	3	3	2
CO3	articulate game mechanics and experiences	3	3	3	3	3
CO4	take part in game structure development	3	3	3	3	3
CO5	plan aesthetics of game development	3	3	3	3	3

**PRECISION AGRICULTURE
(Open Elective – III)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22OE82	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO7	PO8	PO12
CO1	explain the concepts of precision agriculture	3	3	3	3	3
CO2	outline the components of precision agriculture	3	3	3	3	3
CO3	illustrate about tools technologies and sampling	3	3	3	3	3
CO4	adapt recent advances in precision agriculture	2	2	3	3	3
CO5	make use of feasibility and evaluation of precision farming	2	2	3	3	3

**ELECTRONICS FOR HEALTH CARE
(Open Elective – III)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22OE83	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO6	PO8	PO12
CO1	explain the various methods of recording of biopotentials	3	3	3	3	3
CO2	measure biochemical and various physiological information	2	3	2	3	3
CO3	make use of assist devices and biotelemetry	3	3	3	3	3
CO4	use of radiation for diagnostic and therapy	3	3	3	3	3
CO5	adapt techniques of electrical safety in hospitals	3	3	2	3	3

PROJECT STAGE – II INCLUDING SEMINAR

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22ECPR81	-	-	22	11

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	design and develop a prototype/process/simulation for identified problem	3
CO2	execute project using modern tools and prepare the report	3
CO3	exhibit leadership and managerial skills in project development	3
CO4	function effectively as individual and member or leader in project teams	3
CO5	apply engineering knowledge for societal sustenance	3

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (R17)

ENGINEERING MATHEMATICS – I
(Differential Equations & Matrix Algebra)
(Common to all Branches)

I -B.Tech.-I-Sem

Subject Code: 17CS1101BS

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve system of linear equations by using matrices	3	2	1
CO3	find Eigen values and Eigen vectors	3	2	1
CO4	find the extreme values of functions of several variables and evaluation of improper integrals by using Beta and Gamma functions	3	2	1
CO5	evaluate multiple integrals and find the line, surface and volume integrals and convert them by using multiple integrals	3	2	1

APPLIED PHYSICS

I-B.Tech.-I-Sem

Subject Code: 17CS1102BS

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	analyze the crystal structures and X-ray diffraction techniques	3	2	1
CO2	explain the particle behavior in solids using quantum mechanics and band theory of solids	3	2	1
CO3	outline Dielectric and magnetic properties of materials and their applications	3	2	1
CO4	illustrate principles and applications of lasers and optical fibers	3	2	1
CO5	classify semiconductors & Nano-materials and illustrate functioning of various semiconductor devices	3	2	1

ENGINEERING CHEMISTRY

I-B.Tech.-I-Sem

Subject Code: 17CS1103BS

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	identify the properties of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	make use of polymers in domestic and industrial fields	3	2	1
CO4	analyze the quality of fuels used in automobiles, industry and aerospace	3	2	1
CO5	illustrate the properties of various engineering materials	3	2	1

FUNDAMENTALS OF INFORMATION TECHNOLOGY

I-B.Tech.-I-Sem

Subject Code: 17CS1104ES

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the computing fundamentals essential to information technology	3	3	2	2



CO2	demonstrate the functions of operating systems and classify the programming languages	3	3	2	2
CO3	make use of office automation tools	3	3	2	2
CO4	adapt the various file organization and security techniques	3	3	2	2
CO5	outline the basics of computer networks	3	3	2	2

COMPUTER PROGRAMMING

I-B.Tech.-I-Sem

Subject Code: 17CS1105ES

L T P C

3 1 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

APPLIED PHYSICS / ENGINEERING CHEMISTRY LAB

I -B.Tech.-I-Sem

Subject Code: 17CS1106BS

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	identify modulus of elastic materials , determine the characteristics & applications of LED and SOLAR CELL, find the energy gap of a semiconductor and analyze the wavelength of laser source	3
CO2	demonstrate the resonance of LCR circuit, determine Time Constant of RC circuit & find variation of the magnetic field and determine losses in optical fiber	3
CO3	determine the hardness, viscosity and pH of various samples	3
CO4	synthesize the drug used in pharmaceutical industry	3
CO5	estimate the strength of solutions and amount of coloured solutions	3

COMPUTER PROGRAMMING IN C LAB

I-B.Tech.-I-Sem

Subject Code: 17CS1107ES

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3
CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3



IT & ENGINEERING WORKSHOP

I-B.Tech.-I-Sem.

Subject Code: 17CS1108ES

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	install and make use of operating systems and MS office tools	3	3	2	2
CO2	configure fire walls and trouble shoot network connections	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2

NATIONAL SERVICE SCHEME (NSS) / PHYSICAL EDUCATION / YOGA MANDATORY COURSE (NON-CREDIT)

I-B.Tech.-I-Sem.

Subject Code: 17AC1109MC

L T P C
0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO9	PO12
CO1	harness physical literacy and lifelong engagement	3	3	3	3	3
CO2	use aesthetic appreciation	2	1	2	3	3
CO3	build competence and confidence to face challenges	1	2	1	3	3
CO4	develop Sports related values and attitudes	3	3	2	2	3
CO5	follow appropriate etiquette and sports	1	1	2	3	3

ENGINEERING MATHEMATICS – II

(Vector Calculus, Fourier Analysis & PDE)

(Common to all Branches)

I-B.Tech.-II-Sem.

Subject Code: 17CS1201BS

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve ODE by using Laplace transforms	3	2	1
CO2	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO3	solve the line, surface and volume integrals by using vector integration	3	2	1
CO4	find periodic functions in terms of Fourier series and non-periodic functions of Fourier transform	3	2	1
CO5	formulate Partial Differential Equation, solve Linear and non-linear Differential Equations and analyze one dimensional heat and wave equation	3	2	1

PROFESSIONAL COMMUNICATION IN ENGLISH

I-B.Tech.-II-Sem.

Subject Code: 17CS1202HS

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO10	PO12
CO1	apply appropriate vocabulary and grammar	3	1
CO2	use effective writing skills in formal and informal situations	3	1
CO3	demonstrate reading skills to pursue research and academic activities	3	1
CO4	apply and exhibit professional and social Etiquette	3	1
CO5	employ reference and study skills for lifelong learning	3	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

I-B.Tech.-II-Sem.

Subject Code: 17CS1203ES

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws and explain single phase AC circuits	3	3	2	1
CO2	solve electrical circuits using network theorems and illustrate diode characteristic	3	3	2	1
CO3	identify special purpose devices and use diode circuits for various applications	3	3	2	1
CO4	illustrate the configurations and biasing techniques of Bi-polar junction transistor	3	3	2	1
CO5	characterize JFET	3	3	2	1

ENGINEERING GRAPHICS

I-B.Tech.-II-Sem.

Subject Code: 17CS1204ES

L T P C

2 0 3 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2

DATA STRUCTURES THROUGH C

I-B.Tech.-II-Sem.

Subject Code: 17CS1205ES

L T P C

3 1 - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	classify different data structures to design efficient programs	3	3	2	2
CO2	identify appropriate sorting and searching techniques	3	2	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	explain various concepts of non-linear data structures	3	3	2	2
CO5	choose an appropriate hashing technique for a given problem	3	3	2	2



ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

I-B.Tech.-II-Sem.

Subject Code: 17CS1206HS

L T P C

0 0 3 2

The **Language Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	apply the sounds of English for proper pronunciation	3	3
CO2	use the right accent and intonation in formal and informal situations	3	3
CO3	distinguish and neutralize various accents for intelligibility	3	3
CO4	develop speaking and listening skills through audio-visual experiences	3	3
CO5	demonstrate employability skills through various activities	3	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

I-B.Tech.-II-Sem.

Subject Code: 17CS1208ES

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws and network theorems	3
CO2	verify the V-I characteristics of various electronic devices	3
CO3	determine the efficiency of various rectifiers	3
CO4	illustrate the configurations of Bi-polar junction transistor	3
CO5	demonstrate the characteristics of FET and SCR	3

MICRO PROJECT (MANDATORY NON-CREDIT COURSE)

I-B.Tech.-II-Sem.

Subject Code: 17AC1209MC

L T P C

0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	select problem and evaluate	3
CO2	review the literature related to the problem	3
CO3	implement principles of science and Engineering	3
CO4	analyze the problem	3
CO5	present the essence of project work	3

DISCRETE MATHEMATICAL STRUCTURES

II-B.Tech.-I-Sem.

Subject Code: 17CS2101BS

L T P C

4 0 0 4



Principal
CMR INSTITUTE OF TECHNOLOGY
Kandlakoya (V), Medchal Road,
Hyderabad-501 401.

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	verify logical statements using connectives	3	3	2
CO2	perform various operations with relational algebra	3	3	2
CO3	validate arguments using predicate calculus	3	3	2
CO4	solve problems using combinatorics	3	3	2
CO5	simplify real-life situations using graph theory	3	3	3

DIGITAL LOGIC DESIGN

II-B.Tech.-I-Sem.

Subject Code: 17CS2102ES

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12
CO1	distinguish different number systems and digital codes	3	3	2	2	2
CO2	minimize logical functions using Karnaugh Maps	3	3	2	2	3
CO3	construct different combinational logic circuits	3	3	2	2	2
CO4	solve sequential circuits using state reduction methods	3	3	2	2	3
CO5	design complex logical functions using PLDs	3	3	2	2	3

COMPUTER ORGANIZATION

II-B.Tech.-I-Sem.

Subject Code: 17CS2103PC

L T P C
3 1 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12
CO1	identify basic components and design of control unit	3	3	2	2	2
CO2	illustrate the functioning of CPU using 8086 processor	3	3	2	2	3
CO3	solve real time problems using ALP	3	3	2	2	2
CO4	analyze arithmetic operations, I/O operations and memory	3	3	2	2	3
CO5	distinguish pipelining and multiprocessors	3	3	2	2	3

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

II-B.Tech.-I-Sem.

Subject Code: 17CS2104PC

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple java programs using OOP concepts	3	3	2	2
CO2	interpret programs using the concepts of inheritance, polymorphism, packages and interfaces	3	3	2	2
CO3	build efficient and error free codes using the concepts of multithreading and exception handling	3	3	3	3
CO4	design GUI programs using the concepts of AWT and event handling	3	3	3	2
CO5	develop real-time applications using applets and swings	3	3	3	3



DATABASE MANAGEMENT SYSTEMS

II-B.Tech.-I-Sem.

CSubject Code: 17CS2105PC

L T P
4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design simple databases using basic concepts of database architectures	3	3	3	2
CO2	construct databases using ER Modelling to formulate SQL queries	3	3	3	2
CO3	apply normalization on database to eliminate redundancy	3	3	3	2
CO4	illustrate transaction management, concurrency control and recovery techniques	3	3	3	2
CO5	make use of query processing, query optimization and indexing techniques	3	3	3	2

COMPUTER ORGANIZATION LAB

II-B.Tech.-I-Sem.

Subject Code: 17CS2106PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	design logic gates using NAND and NOR gates	3	3
CO2	construct the combinational and sequential logic circuits	3	3
CO3	solve simple problems using ALP	3	3
CO4	implement string handling operations using ALP	3	3
CO5	develop programs using procedures and macros	3	3

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

II-B.Tech.-I-Sem.

Subject Code: 17CS2107PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	write, compile and execute simple java programs	3	3
CO2	develop programs using inheritance, polymorphism, packages and Interfaces	3	3
CO3	demonstrate multithreading and exception handling mechanisms	3	3
CO4	design GUI using the concepts of AWT and event handling	3	3
CO5	build real-time applications using applets and swings	3	3

DATABASE MANAGEMENT SYSTEMS LAB

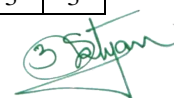
II-B.Tech.-I-Sem.

Subject Code: 17CS2108PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	construct databases using SQL commands	3	3
CO2	apply normalization techniques to eliminate redundancy	3	3



CO3	design a database schema for a given domain	3	3
CO4	solve queries based on joins, nested queries and aggregate functions	3	3
CO5	execute PL / SQL programs for a given application	3	3

GENDER SENSITIZATION LAB

MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-I-Sem.

Subject Code: 17HS2109MC

L T P C

0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

VERBAL ABILITY

MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-I-Sem.

Subject Code: 17HS2110MC

L T P C

0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	recall grammatical and basic sentence structures for communication	3	3
CO2	list out various vocabulary forms and improve verbal ability	3	3
CO3	use sentence structures without errors	3	3
CO4	apply the sentence structure for effective paraphrasing	3	3
CO5	demonstrate effective verbal skills	3	3

STATISTICAL AND NUMERICAL METHODS

II-B.Tech.-II-Sem.

Subject Code: 17CS2201BS

L T P C

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	differentiate among random variables involved in the probability models	3	2	1
CO2	test hypothesis for large samples	3	2	1
CO3	test hypothesis for small samples	3	2	1
CO4	solve transcendental, linear and non-linear system of equations using numerical methods	3	2	1
CO5	find the numerical solutions for first order initial value problems and integrals	3	2	1

OPERATING SYSTEMS

II-B.Tech.-II-Sem.

Subject Code: 17CS2202PC

L T P C

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
-----	--	-----	-----	------



CO1	outline various concepts and structures of operating systems	3	3	2
CO2	solve synchronization problems by using process management	3	3	2
CO3	adapt various deadlock handling and memory management mechanism	3	3	2
CO4	analyze various file management system	3	3	2
CO5	make use of I/O Management and security mechanisms	3	3	2

COMPUTER NETWORKS

II-B.Tech.-II-Sem.

Subject Code: 17CS2203PC

L T P C

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	outline the basics of computer networks and various layers	3	3	2	3
CO2	demonstrate data link layer and multiple access protocols	3	3	2	3
CO3	interpret network layer and routing algorithms	3	3	3	3
CO4	illustrate various transport protocols	3	3	3	3
CO5	make use of various protocols of application layer	3	3	2	3

DESIGN AND ANALYSIS OF ALGORITHMS

II-B.Tech.-II-Sem.

Subject Code: 17CS2204PC

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	measure time and space complexity of algorithms	3	3	3	3
CO2	solve problems using disjoint sets and divide-and-conquer techniques	3	3	2	2
CO3	apply greedy method and dynamic programming paradigm to solve the problems	3	3	2	2
CO4	adapt back-tracking and branch-bound methods to solve problems	3	3	2	2
CO5	interpret NP-hard and NP-complete problems	3	3	2	2

FINANCIAL ANALYSIS, MANAGEMENT & ECONOMICS

II-B.Tech.-II-Sem.

Subject Code: 17CS2205HS

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	analyze financial performance of an enterprise using final accounts and ratio	3	2
CO2	apply principles of management in professional career	3	2
CO3	make use of principles of economics for decision making	3	2
CO4	identify business environment and laws of demand	2	3
CO5	solve problems in the areas of production, cost, price and markets	3	3

COMPUTER NETWORKS & OPERATING SYSTEMS LAB

II-B.Tech.-II-Sem.

Subject Code:17CS2206PC

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	make use of the NS2/NS3 tools	3	3	3

(Signature)

CO2	analyze media and tools include coaxial cable, UTP cable and crimping tool	3	3	3
CO3	apply appropriate network model for data communications	3	3	3
CO4	simulate operating system concepts	3	3	3
CO5	write C programs using UNIX system calls	3	3	3

DESIGN AND ANALYSIS OF ALGORITHMS LAB

II-B.Tech.-II-Sem.

Subject Code:17CS2207PC

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	analyze the complexities of various problems in different domains	3	3	3
CO2	design algorithms using the dynamic programming	3	3	3
CO3	develop an algorithms for sorting, graph related, combinatorial based problems	3	3	3
CO4	distinguish the performance of algorithms using language features	3	3	3
CO5	apply earned algorithm design techniques real world problems	3	3	3

SCRIPTING LANGUAGES LAB

II-B.Tech.-II-Sem.

Subject Code:17CS2208PC

L T P C

0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PO14
CO1	comprehend the differences between typical scripting languages	3	3	3	3	3	3
CO2	perceive strengths and weakness of Perl, PHP and Python	3	3	3	3	3	3
CO3	demonstrate the uses of PHP methodologies arrays, associative array and files	3	3	3	3	3	3
CO4	analyze the performance of perl features	3	3	3	3	3	3
CO5	illustrate various features of python	3	3	3	3	3	3

ENVIRONMENTAL SCIENCE AND TECHNOLOGY MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-II-Sem.

Subject Code:17HS2209MC

L T P C

3 0 0 -

Pre requisites: Basic knowledge in Science & Technology

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2



**ANALYTICAL SKILLS
MANDATORY COURSE (NON-CREDIT)**

II-B.Tech.-II-Sem.
Subject Code:17BS2210MC

L T P C
0 0 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	apply operations like searching, insertion, deletion, traversing mechanism etc. on various data structures	3	3
CO2	apply measurement techniques to data collection and utilize their innovative thinking skills to project themselves for finding fresh approaches towards tribulations	3	3
CO3	use the skills for effective communication	3	3
CO4	identify different types of arguments as well as their premises and conclusions	3	3
CO5	demonstrate the mathematical reasoning, including the ability to prove simple results and/or make statistical inferences	3	3

LINUX PROGRAMMING

III-B.Tech. I-Sem
Subject Code: 17CS3101PC

L T P C
3 1 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	perceive the Linux operating systems and its utilities	3	3	2
CO2	illustrate various bash shell commands	3	3	2
CO3	create the file and management with various system calls	3	3	2
CO4	demonstrate process control and its management	3	3	2
CO5	develop inter process communication between two different systems with LAN connection	3	3	2

FORMAL LANGUAGES AND AUTOMATA THEORY

III -B.Tech.-I-Sem.
Subject Code: 17CS3102PC

L T P C
4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the concepts of formal languages and finite automata techniques	3	3	3	2
CO2	design various finite automata and its conversion	3	3	3	2
CO3	build finite automata for different regular expressions and languages	3	3	3	2
CO4	summarize context free grammar and construction of PDA	3	3	3	2
CO5	construct turing machines and analyze undecidability	3	3	3	2

DATA MINING & DATA WAREHOUSING

III-B.Tech.-I-Sem
Subject Code: 17CS3103PC

L T P C
4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO13
CO1	importance of Data Warehouses in addition to database systems	3	2	2	2	2
CO2	perform the pre processing of data and apply mining techniques on it	3	3	2	2	3
CO3	perceive the concepts and functionalities of Data Mining	3	3	3	2	3
CO4	analyze the importance of Descriptive Data Mining tasks	3	2	2	2	3
CO5	solve real world problems in business and scientific information using data mining	3	3	3	3	3

WEB TECHNOLOGIES

III – B.Tech. I - Sem

Subject Code: 17CS3104PC

L T P C

4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	apply the design principles of HTML and Java Script to create static and dynamic web pages	3	2	2	3	3
CO2	develop server side scripting with PHP language	3	2	2	3	3
CO3	illustrate server side programming with java Servlets	3	3	3	3	3
CO4	demonstrate server side programming with java JSP	3	3	3	3	3
CO5	design web application using MVC	3	3	3	3	3

DISASTER MANAGEMENT (Open Elective-I)

III-B.Tech.-I-Sem.

Subject Code: 17CE3105OE

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

OPERATIONS RESEARCH (Open Elective-I)

III-B.Tech.-I-Sem.

Subject Code: 17ME3105OE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	formulate and solve linear programming problem using various methods	3	2	3
CO2	solve transportation and assignment problems	3	3	3
CO3	compute sequencing and inventory model problems	2	2	3
CO4	analyze waiting lines and game theory problems	3	3	3
CO5	evaluate replacement and dynamic programming problems	2	3	3



ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Open Elective-I)

III B.Tech. I-Sem
Subject Code: 17EC3105OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

JAVA PROGRAMMING

(Open Elective-I)

III-B.Tech.-I-Sem.
Subject Code: 17CS3105OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	build efficient code using multithreading and exception handling	3	2	3	3	2
CO4	illustrate event handling mechanism	3	2	3	3	2
CO5	make use if applets and swing concepts	3	2	3	3	2

LINUX PROGRAMMING LAB

III – B.Tech. – I - Semester
Subject Code: 17CS3106PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	perceive the Linux Shell Environment	3	3	3
CO2	illustrate the File Management and Multiple Task Using Shell Scripts in Linux Environment	3	3	3
CO3	create and manage process	3	3	3
CO4	demonstrate process communication within and between systems	3	3	3
CO5	design network based application	3	3	3



DATA MINING & DATA WAREHOUSING LAB

III-B.Tech.-I-Sem
Subject Code: 17CS3107PC

L T P C
0 0 3 2

Prerequisites: Database Management Systems

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	make use of various kinds of tools in data mining	3	3	3
CO2	demonstrate the Classification, Clusters in large Data sets	3	3	3
CO3	classify mining algorithms as a component to the exiting tools	3	3	3
CO4	apply mining techniques for realistic data	3	3	3
CO5	solve real time problems using various data mining functionalities	3	3	3

WEB TECHNOLOGIES LAB

III – B.Tech. – I - Semester
Subject Code: 17CS3108PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	design web pages using HTML, CSS and JavaScript	3	3	3
CO2	build web application using PHP and MySQL	3	3	3
CO3	create web application using PHP and XML	3	3	3
CO4	develop web application using servlets and JDBC	3	3	3
CO5	construct web application using JSP and JDBC	3	3	3

HUMAN VALUES & PROFESSIONAL ETHICS MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-I-Sem.
Subject Code: 17HS3109MC

L T P C
3 0 0 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO12
CO1	apply the importance of human values for personal and societal development	3	3	3	2
CO2	develop ethics and professional attitude	2	2	3	2
CO3	explain ethical standards in a professional environment	3	3	3	2
CO4	distinguish between professional rights and employee rights	3	3	3	2
CO5	identify their role in professional spheres	3	3	3	3

SOFT SKILLS (MANDATORY COURSE)

III-B.Tech- I Sem.
Subject Code: 17HS3110MC

L T P C
0 0 2 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
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CO1	identify the need for self awareness and exhibit professional attitude	3	3
CO2	interpret and improve in personal and professional communication	3	3
CO3	develop leadership skills and enhance the employability	3	3
CO4	recognize the importance of decision making and change management to improve professional attributes	3	3
CO5	apply interview techniques for overall development	3	3

COMPILER DESIGN

III-B.Tech.-II-Sem
Subject Code: 17CS3201PC

L T P C
4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	illustrate the various phases of compiler	3	3	3	2	2
CO2	construct top down and bottom up parsers	3	3	3	2	2
CO3	adapt intermediate Code Generation techniques and run-time storage allocation strategies	3	3	3	2	2
CO4	simplify the code using code optimization techniques	3	3	3	2	2
CO5	apply generic code generation algorithm to generate target code	3	3	3	2	2

CLOUD COMPUTING

III-B.Tech.-II-Sem
Subject Code: 17CS3202PC

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO13
CO1	explain various computing paradigms	3	2	3	2	2
CO2	illustrate fundamentals of cloud computing	3	2	3	2	2
CO3	elaborate cloud computing architecture and management	3	3	3	2	2
CO4	perceive various cloud service models	3	3	3	2	2
CO5	select various cloud service providers	3	2	3	2	2

SOFTWARE ENGINEERING

III-B.Tech.-II-Sem
Subject Code: 17CS3203PC

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO11	PO12	PO13
CO1	apply software engineering principles and techniques	3	3	3	3	3	3
CO2	identify requirements, analyze and prepare models	3	3	3	3	3	3
CO3	design a system, component or process to meet the desired needs	3	3	3	3	3	3
CO4	analyze various testing techniques by using various metrics	3	3	3	3	3	3
CO5	adapt risk management strategies to assure software quality	3	2	3	3	3	3



GLOBAL WARMING & CLIMATE CHANGE
(Open Elective – II)

III-B.Tech.-II-Sem.
Subject Code: 17CE3204OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO6	PO7	PO8	PO12
CO1	describe the various consequences of climate change	3	3	3	3	2
CO2	illustrate the methods of measurement of climate change	3	3	3	3	2
CO3	analyze the causes for climate change and its impacts	3	3	3	3	2
CO4	evaluate the impact of global warming and climate change	3	3	3	3	2
CO5	explain various mitigation techniques	3	3	3	3	2

FUNDAMENTALS OF ROBOTICS
(Open Elective – II)

III-B.Tech-II-Sem
Code: 17ME3204OE

L T P C Subject
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2
CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate sensors for robot	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

PRINCIPLES OF COMMUNICATION SYSTEMS
(Open Elective – II)

III -B.Tech.-II-Sem
Subject Code: 17EC3204OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the fundamentals of communication systems	3	2	2	2
CO2	analyze various analog modulation and demodulation schemes	3	3	3	2
CO3	explain sampling theorem, pulse modulation and multiplexing techniques	3	3	3	2
CO4	illustrate digital modulation schemes	3	3	2	2
CO5	develop source and channel coding techniques	3	3	3	2

DATABASE MANAGEMENT SYSTEMS
(Open Elective – II)

III-B.Tech- II Sem
Subject Code: 17CS3204OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2

MULTIMEDIA COMPUTING (Professional Elective - I)

III-B.Tech-II-Sem
Subject Code: 17CS3205PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO12	PO13
CO1	perceive the characteristics of different multimedia data	3	3	2	2
CO2	distinguish various data formats and multimedia system designs	3	3	2	2
CO3	apply different compression principles and compression techniques	3	3	2	2
CO4	analyze different multimedia systems and its applications	3	3	2	2
CO5	solve multimedia applications using multimedia data	3	3	2	2

COMPUTER GRAPHICS (Professional Elective-I)

III-B.Tech –II-Sem.
Subject Code: 17CS3206PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO13
CO1	analyze the principles, paradigms and techniques of CG	3	3	3	2	2
CO2	illustrate OpenGL, cross-language, cross-platform API	3	3	3	2	2
CO3	make use of computer aided design for content presentation	3	3	3	2	2
CO4	design basic graphics application programs including animation	3	3	3	2	2
CO5	develop a facility with the relevant mathematics of CG	3	3	3	2	2

MOBILE APPLICATION DEVELOPMENT (Professional Elective-I)

III – B.Tech II- Sem
Subject Code: 17CS3207PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12	PO13
CO1	perceive mobile devices and mobile platforms	3	3	3	3	2	2
CO2	design the user interfaces for mobile applications	3	3	3	3	2	2
CO3	develop applications for mobile devices	3	3	3	3	2	2
CO4	simulate mobile applications using Android and Eclipse simulator	3	3	3	3	2	2
CO5	prepare a mobile application for distribution	3	3	3	3	2	2



**PRINCIPLES OF PROGRAMMING LANGUAGES
(Professional Elective-I)**

III -B.Tech.-II-Sem
Subject Code: 17CS3208PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PO13
CO1	predict various programming paradigms, express syntax and semantics in formal notation	3	3	3	2	2	2
CO2	build programming paradigms to develop applications	3	3	3	2	2	2
CO3	generate subprograms and blocks	3	3	3	2	2	2
CO4	develop code using logical programming languages	3	3	3	2	2	2
CO5	create complex programs using various programming languages	3	3	3	2	2	2

COMPILER DESIGN & MOBILE APPLICATION DEVELOPMENT (ANDROID) LAB

III-B.Tech. II-Sem.
Subject Code: 17CS3209PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	design lexical analyzer using JLex,flex or lex or other tools	3	3	3
CO2	illustrate predictive parser using recursive decent parser and LL parser	3	3	3
CO3	generate machine code from the abstract syntax tree generated by the parser	3	3	3
CO4	install and configure Android application development tools	3	3	3
CO5	develop user Interfaces for the Android platform	3	3	3

CLOUD APPLICATION DEVELOPMENT LAB

III-B.Tech.-II-Sem
Subject Code: 17CS3210PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	analyze the use of Cloud Applications	3	3	3
CO2	create virtual machines from available physical resources	3	3	3
CO3	demonstrate the benefits of various cloud computing platforms	3	3	3
CO4	make use of modern tools to built cloud applications	3	3	3
CO5	design and develop application using AWS	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS (AECS) LAB

III-B. Tech.-II Sem.
Subject Code: 17CS3211HS

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3



CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3

QUANTITATIVE APTITUDE MANDATORY COURSE (NON-CREDIT)

III-B.Tech. I-Sem.

Subject Code: 17BS3212MC

L T P C
0 0 2 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	Recall the basics of number systems and apply them accordingly	3	3
CO2	Apply the concepts of percentages, profit and loss, & Interests in real life situations	3	3
CO3	demonstrate various principles related to Distance ,speed ,time and work in solving mathematical problems	3	3
CO4	distinguish between permutations and combinations ,clocks and calendars for solving problems	3	3
CO5	apply principles of geometry and menstruation to achieve qualitative results at workplace	3	3

NETWORK SECURITY & CRYPTOGRAPHY

IV-B.Tech I-Sem.

Subject Code: 17CS4101PC

L T P C
4 0 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PO13
CO1	perceive basic cryptographic algorithms, message and web authentication and security issues	2	2	2	3	2	3
CO2	identify security system requirements for both of them such as client and server	3	3	3	3	3	3
CO3	design various cryptographic algorithms	3	3	3	3	3	3
CO4	illustrate a network and flow of information	3	3	3	3	3	3
CO5	make use of security key management in network security	3	3	3	3	3	3

BIG DATA ANALYTICS

IV B.Tech I-Sem

Subject Code:17CS4102PC

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	identify big data and its business Implications	3	2	2	2	2
CO2	illustrate access and process data on distributed file system	3	3	3	2	3
CO3	demonstrate Hadoop Eco system using Pig	3	3	3	2	3
CO4	develop big data solutions using , Hive and Hbase	3	2	3	2	3



CO5	apply machine learning techniques using R	3	3	3	3	3
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MACHINE LEARNING

IV-B.Tech.I-Sem.

Subject Code: 17CS4103PC

L T P C

4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12	PO13
CO1	outline the functionalities of machine learning	3	3	3	2	3	3
CO2	analyze the decision tree learning and artificial neural networks	3	3	3	3	3	3
CO3	develop Bayesian and computational learning approaches	3	3	3	2	2	3
CO4	demonstrate instance-based learning algorithms	3	3	3	3	3	3
CO5	illustrate the learning set concepts	3	3	3	3	3	3

ENVIRONMENTAL IMPACT ASSESSMENT

(Open Elective – III)

IV-B.Tech.-I-Sem.

Subject Code: 17CE4104OE

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO10	PO12
CO1	identify the attributes to be considered for EIA	3	3	3	3
CO2	assess impact of deforestation	3	3	3	3
CO3	interpret impact prediction, significance of soil quality and mitigation	3	3	2	3
CO4	conduct environmental audit and prepare reports	3	3	2	3
CO5	illustrate environmental policies and provisions	3	3	3	3

PRINCIPLES OF ENTREPRENEURSHIP

(Open Elective – III)

IV-B.Tech. I-Sem.

Subject Code: 17ME4104OE

L T P C

3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3

PRINCIPLES OF EMBEDDED SYSTEMS

(Open Elective – III)

IV -B.Tech.-I-Sem.

Subject Code: 17EC4104OE

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the basic concepts of embedded computing	3	3	2	2
CO2	illustrate the architecture of 8051 microcontroller	3	3	3	2
CO3	develop embedded programs using 8051 microcontroller	3	3	3	2
CO4	demonstrate 8051 microcontroller interface with peripherals	3	3	3	2
CO5	explain real time operating system concepts	3	3	3	3

WEB TECHNOLOGIES (Open Elective – III)

IV – B.Tech. – I - Semester
Subject Code: 17CS4104OE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2

ARTIFICIAL INTELLIGENCE (Professional Elective-II)

IV- B.Tech.- II Semester
Subject Code: 17CS4105PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12	PO13
CO1	explain the concepts of artificial intelligence	3	3	3	3	2	3
CO2	illustrate various search algorithms	3	3	3	3	2	3
CO3	adapt various probabilistic reasoning approaches	3	3	2	3	3	3
CO4	elaborate Markov decision process	3	3	2	3	2	3
CO5	perceive various reinforcement learning approaches	3	3	2	3	3	3

HUMAN COMPUTER INTERACTION (PROFESSIONAL ELECTIVE - II)

IV-B.Tech- I-Sem.
Subject Code: 17CS4106PE

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO8	PO12	PO13
CO1	identify user interfaces and its interactions	3	3	3	2	2	3	2
CO2	illustrate screen design techniques	3	3	3	2	2	2	2
CO3	select components and devices for screen controls	3	3	3	3	3	3	2
CO4	make use of designer tools and techniques for interface	3	3	3	2	3	2	2
CO5	build interface design using software tools and devices	3	3	3	2	3	3	2



**SOCIAL NETWORK ANALYSIS
(PROFESSIONAL ELECTIVE - II)**

IV-B.Tech.-I-Sem.
Subject Code: 17CS4107PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12	PO13
CO1	develop semantic web related applications	3	3	3	3	3	2	3
CO2	illustrate knowledge using ontology	3	3	3	3	2	2	3
CO3	apply RDF schemas on any data	3	3	2	3	3	3	3
CO4	predict human behavior in social web and related communities	3	3	2	3	3	2	3
CO5	adapt social networks applications	3	3	2	3	3	3	3

DISTRIBUTED SYSTEMS

IV-B.Tech I-Sem.
Subject Code: 17CS4108PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO12	PO13
CO1	perceive various architectures used to design distributed systems	3	2	2	2
CO2	build distributed systems using various inter process communication techniques	3	3	2	2
CO3	evaluate distributed algorithms for clock synchronization	3	3	2	2
CO4	analyze the role of middleware using RPC,RMI and design a name server	3	2	2	2
CO5	apply fault tolerant techniques to improve concurrency	3	3	3	2

NETWORK SECURITY & CRYPTOGRAPHY LAB

IV-B.Tech I-Sem
Subject Code: 17CS4109PC

L T P C
4 1 0 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	perceive basic cryptographic algorithms, message and web authentication and security issues	3	3	3
CO2	identify security system requirements for both of them such as client and server	3	3	3
CO3	design various cryptographic algorithms	3	3	3
CO4	illustrate a network and flow of information	3	3	3
CO5	make use of security key management in network security	3	3	3

BIG DATA ENGINEERING LAB

IV B.Tech I Sem
Subject Code: 17CS4110PC

L T P C
0 0 3 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	identify big data and its business Implications	3	3	3



CO2	illustrate access and process data on distributed file system	3	3	3
CO3	demonstrate Job Execution in Hadoop Environment	3	3	3
CO4	develop big data Solutions using Hadoop Eco System	3	3	3
CO5	apply machine learning techniques using R	3	3	3

**FOREIGN LANGUAGE: FRENCH
MANDATORY COURSE (NON-CREDIT)**

IV-B.Tech.-I-Sem.

Subject Code: 17HS4112MC

L T P C
3 0 0 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	identify the basic structure of French language, spelling and pronunciation	3	3
CO2	reproduce the grammatical structure for basic communication	3	3
CO3	recognize and use the grammatical structures for general comprehension	3	3
CO4	use the grammatical and lexical notions in formal and informal situations	3	3
CO5	apply the language skills in communicating effectively at a global platform	3	3

**FOREIGN LANGUAGE: GERMAN
MANDATORY COURSE (NON-CREDIT)**

IV-B.Tech.-I-Sem.

Subject Code: 17HS4113MC

L T P C
3 0 0 0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	identify the basic structure of German language, spelling and pronunciation	3	3
CO2	reproduce the grammatical structure for self introduction	3	3
CO3	recognize and use the grammatical article structures for basic conversation	3	3
CO4	use the grammatical and verb structure for formal and informal situations	3	3
CO5	apply the language skills in communicating effectively at a global platform	3	3

INTERNET OF THINGS (IOT)

IV B.Tech II Sem

Subject Code: 17CS4201PC

L T P C
4 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PO13
CO1	explain the concepts of IoT	3	2	3	3	2	2
CO2	illustrate IoT architecture	3	2	3	3	2	3
CO3	design IoT methodology using python	3	3	3	3	2	3
CO4	solve IoT application frame work	3	3	3	3	2	3
CO5	develop IoT for real time applications	3	2	3	3	3	3



ETHICAL HACKING (Professional Elective-III)

IV-B.Tech II-Sem.
Subject Code: 17CS4202PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PO13
CO1	outline the framework and security issues related to ethical hacking	3	2	2	3	2	3
CO2	plan and execute controlled attacks to safeguard the business	3	3	3	3	2	3
CO3	identify security lapses and prepare for an ethical hack	3	3	3	3	3	3
CO4	make use of enumeration and exploitation techniques	3	3	3	3	2	3
CO5	adapt best practices for deliverables and integration for security	3	3	3	3	3	3

SOFTWARE TESTING METHODOLOGIES (Professional Elective-III)

IV-B.Tech.-II-Sem.
Subject Code: 17CS4203PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO12	PO13
CO1	explain the concepts of STM, flow graphs and path testing	3	2	2	3	3
CO2	illustrate domain testing mechanism	3	3	3	3	3
CO3	distinguish transaction and data flow testing methods	3	3	3	3	3
CO4	make use of paths, products, expressions and logical testing strategies	3	3	3	3	3
CO5	apply transition testing and graph matrices to solve real time problems	3	3	3	3	3

WEB MINING (Professional Elective-III)

IV-B.Tech.-II-Sem.
Subject Code: 17CS4204PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO12	PO13
CO1	Outline the concepts of mining	3	2	2	2	2
CO2	apply machine learning concepts to web content mining	3	3	3	3	2
CO3	identify linking and crawling techniques for web mining	3	3	3	3	2
CO4	make use of structured data extraction techniques	3	3	3	2	2
CO5	analyze the algorithms for web usage mining	3	3	3	3	2

NEURAL NETWORKS (Professional Elective-III)

IV- B. Tech. II-Sem
Subject Code: 17CS4205PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PO13
CO1	illustrate the functionalities of neural networks and learning process	3	3	2	3	3	3
CO2	analyze the single-layer and multi-layer perceptrons	3	3	3	3	3	3
CO3	outline the back propagation algorithms	3	3	3	3	3	3
CO4	choose appropriate Self-Organization Maps	3	3	3	3	3	3
CO5	make use of Neuro Dynamics	3	2	2	3	3	3

INFORMATION RETRIEVAL SYSTEMS (Professional Elective-IV)

IV-B.Tech II-Sem
Subject Code: 17CS4206PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	outline information retrieval strategies	3	2	2	3	3
CO2	make use of various retrieval utilities for improving search	3	3	3	3	3
CO3	illustrate CLIR and its efficiency	3	3	3	3	3
CO4	formulate queries for semi-structured data	3	3	3	3	3
CO5	demonstrate distributed Information retrieval data	3	3	3	3	3

COMPUTER FORENSICS (Professional Elective-IV)

IV-B.Tech.I-Sem
Subject Code: 17CS4207PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PO13
CO1	explain the fundamentals of computer forensics	3	2	2	3	3	3
CO2	illustrate the methods for evidence collection and data seizure	3	3	3	3	3	3
CO3	analyze and validate digital forensic evidences	3	3	3	3	3	3
CO4	solve the computer fraud cases using forensics tools	3	3	3	3	3	3
CO5	make use of various operating systems for computer forensics	3	3	3	3	3	3

NATURAL LANGUAGE PROCESSING (Professional Elective-IV)

IV-B.Tech.II-Sem
Subject Code: 17CS4208PE

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PO13
CO1	explain fundamentals of NLP and morphology	3	2	3	3	3	3
CO2	demonstrate word level statements and syntactic analysis	3	2	3	3	3	3
CO3	make use of context free grammar and parsing techniques	3	3	3	3	3	3
CO4	apply semantic analysis techniques to solve various problems	3	3	3	3	3	3
CO5	illustrate language generation and discourse analysis	3	2	3	3	3	3



SOFTWARE PROJECT MANAGEMENT
(Professional Elective-IV)

IV-B.Tech. II-Sem
Subject Code: 17CS4209PE

L T P C
3 0 0 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO11	PO12	PO13
CO1	outline the concepts of software management and economics	3	2	2	2	3	3
CO2	illustrate artifacts and life cycle phases	3	3	3	2	3	3
CO3	design various workflows and process planning	3	3	3	3	3	3
CO4	adapt automated project planning and control	3	3	3	3	3	3
CO5	apply contemporary software project management practices	3	3	3	3	3	3

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (R18)

ENGINEERING MATHEMATICS – I (Linear Algebra and Calculus)

I-B.Tech-I-Sem.

Subject Code: BSC-101

L T P C

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	analyze the nature of sequences and series	3	2	1
CO4	verify mean value theorems and evaluate improper integrals by using Beta and Gamma functions	3	2	1
CO5	find the extreme values of functions of two variables	3	2	1

APPLIED PHYSICS

I-B.Tech.-I-Sem.

Subject Code: BSC-103

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the principles of Quantum Mechanics	3	2	1
CO2	analyze various electron theories of conduction in solids	3	2	1
CO3	classify semiconductors and relate functioning of semiconductor devices	3	2	1
CO4	illustrate principles and applications of lasers and optical fibers	3	2	1
CO5	outline dielectric and magnetic properties of materials	3	2	1

ENGLISH

I-B.Tech.-I-Sem.

Subject Code: HSMC-101

L T P C

2 - - 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in RAWLS skills	3	1
CO2	demonstrate the acquired language in written and spoken contexts	3	1
CO3	express, restate and respond appropriately by comprehending the given data	3	1
CO4	develop proficiency to succeed in academic activities, research and career	3	1
CO5	excel in professional and social etiquette	3	1

PROGRAMMING FOR PROBLEM SOLVING

I-B.Tech.-I-Sem.

Subject Code: ESC-103

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
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CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

ENGINEERING GRAPHICS

I-B.Tech-I-Sem.

Subject Code: ESC-109

L T P C

1 - 4 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2

APPLIED PHYSICS LAB

I-B.Tech.-I-Sem.

Subject Code: BSC-104

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	demonstrate the electrical properties of a semiconductor	3
CO2	compare practical results with theoretical calculations in electrical circuits	3
CO3	demonstrate the properties of lasers and optical fibers	3
CO4	find the energy gap of a semiconductor and identify its band structure	3
CO5	examine electrical resonance in LCR circuits	3

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

I-B.Tech-I-Sem.

Subject Code: HSMC-102

L T P C

- - 2 1

The **Language Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	identify the nuances of the language through multimedia experience	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3
CO4	develop speaking and listening skills	3	3
CO5	appraise communication and correspond effectively	3	3

PROGRAMMING FOR PROBLEM SOLVING LAB



I- B.Tech-I-Sem.
Subject Code: ESC-104

L T P C
- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3
CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3

TECHNOLOGY EXPLORATION FOR SOCIAL INNOVATION LAB - I
MANDATORY COURSE (NON-CREDIT)

I-B.Tech.-I-Sem.
Subject Code: MC-101

L T P C
- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	identify the problems	3
CO2	illustrate social innovation	3
CO3	choose suitable processes	3
CO4	design suitable prototype	3
CO5	develop feasibility report	3

ENGINEERING MATHEMATICS – II
(Advanced Calculus)

I-B.Tech.-II-Sem.
Subject Code: BSC-102

L T P C
3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve linear and non-linear partial differential equations	3	2	1
CO3	evaluate the line, surface and volume integrals and convert them from one to another by using multiple integrals	3	2	1
CO4	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

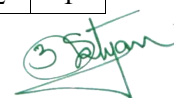
ENGINEERING CHEMISTRY

I-B.Tech.-II-Sem.
Subject Code: BSC-107

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1



CO4	illustrate the various fuels, synthesis of polymers and drugs	3	2	1
CO5	analyze the properties of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

I-B.Tech.-II-Sem.

L T P C

Subject Code: ESC-101

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	explain the concepts of single phase and three phase AC circuits	3	3	2	1
CO3	elaborate the working principles and construction of AC and DC machines	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1

DATA STRUCTURES

I-B.Tech.-II-Sem.

L T P C

Subject Code: ESC-105

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	classify different data structures to design efficient programs	3	3	2	2
CO2	identify appropriate sorting and searching techniques	3	2	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	explain various concepts of non-linear data structures	3	3	2	2
CO5	choose an appropriate hashing technique for a given problem	3	3	2	2

ENGINEERING CHEMISTRY LAB

I-B.Tech.-II-Sem.

L T P C

Subject Code: BSC-108

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	determine the hardness in water samples to solve societal problems	3
CO2	estimate the strength of the given solutions	3
CO3	analyze adsorption and viscosity of various fluids	3
CO4	synthesize the various organic compounds used in medical industry	3
CO5	verify and understand the distribution coefficient	3

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB

I-B.Tech.-II-Sem.

L T P C

Subject Code: ESC-102

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws and network theorems	3
CO2	find the efficiency of AC and DC machines	3
CO3	verify the V-I characteristics of various electronic devices	3
CO4	determine the efficiency of various rectifiers	3
CO5	illustrate the configurations of Bi-polar junction transistor	3

DATA STRUCTURES LAB

I-B.Tech.-II-Sem.

Subject Code: ESC-106

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	implement various searching and sorting techniques	3
CO2	demonstrate basic operations of stack and queues using arrays and linked lists	3
CO3	apply stack data structure to solve various computing problems	3
CO4	demonstrate and apply different methods for traversing graphs	3
CO5	construct binary search tree	3

IT & ENGINEERING WORKSHOP

I-B.Tech.-II-Sem.

Subject Code: ESC-110

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	install and make use of operating systems and MS office tools	3	3	2	2
CO2	configure fire walls and trouble shoot network connections	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2

TECHNOLOGY EXPLORATION FOR SOCIAL INNOVATION LAB - II MANDATORY COURSE (NON-CREDIT)

I-B.Tech.-II-Sem.

Subject Code: MC-102

L T P C

- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	deploy suitable mechanisms	3
CO2	develop platform based innovations	3
CO3	demonstrate data acquisition and analytical skills	3
CO4	execute projects using suitable management techniques	3
CO5	adapt ethics and code of conduct	3



DISCRETE MATHEMATICS

II-B.Tech.-I-Sem.

Subject Code: ESC-210

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	verify logical statements using connectives	3	3	2
CO2	validate arguments using predicate calculus	3	3	2
CO3	perform various operations with relational algebra	3	3	2
CO4	solve problems using combinatorics	3	3	2
CO5	simplify real-life situations using graph theory	3	3	3

DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION

II-B.Tech.-I Sem.

Subject Code: ESC-211

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12
CO1	interpret number systems and logical functions using K-Maps	3	3	2	2	2
CO2	design various combinational and sequential circuits	3	3	2	2	3
CO3	illustrate computer components and function of 8086 processor	3	3	2	2	2
CO4	analyze arithmetic operations and I/O operations	3	3	2	2	3
CO5	distinguish various memories and pipelining operations	3	3	2	2	3

PYTHON PROGRAMMING

II-B.Tech.-I-Sem.

Subject Code: CS-PCC-211

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	perceive the fundamentals of python programming	3	3	2	2
CO2	develop programs using control statements	3	3	2	2
CO3	analyze the programming performances using functions	3	3	2	2
CO4	make use of collections in python programming	3	3	3	2
CO5	design classes and build error-free codes	3	3	3	3

OOP THROUGH JAVA

II-B.Tech.-I-Sem.

Subject Code: CS-PCC-212

L T P C

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple java programs using OOP concepts	3	3	2	2
CO2	interpret programs using the concepts of inheritance, polymorphism, packages and interfaces	3	3	2	2
CO3	build efficient and error free codes using the concepts of multithreading	3	3	3	3



	and exception handling				
CO4	design GUI programs using the concepts of AWT and event handling	3	3	3	2
CO5	develop real-time applications using applets and swings	3	3	3	3

DATABASE MANAGEMENT SYSTEMS

II-B.Tech.-I-Sem.

Subject Code: CS-PCC-213

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design simple databases using basic concepts of database architectures	3	3	3	2
CO2	construct databases using ER Modelling	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	2
CO4	apply normalization on database to eliminate redundancy	3	3	3	2
CO5	illustrate the mechanisms of transaction management, concurrency control and recovery system	3	3	3	2

PYTHON PROGRAMMING LAB

II-B.Tech.-I-Sem.

Subject Code: CS-PCC-214

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	write simple programs using python	3	3
CO2	develop programs using control statements	3	3
CO3	implement functions in programming	3	3
CO4	make use of lists and tuples in python	3	3
CO5	demonstrate file I/O operations	3	3

OOP THROUGH JAVA LAB

II-B.Tech.-II-Sem.

Subject Code: CS-PCC-215

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	write, compile and execute simple java programs	3	3
CO2	develop programs using inheritance, polymorphism, packages and Interfaces	3	3
CO3	demonstrate multithreading and exception handling mechanisms	3	3
CO4	design GUI using the concepts of AWT and event handling	3	3
CO5	build real-time applications using applets and swings	3	3

DATABASE MANAGEMENT SYSTEMS LAB

II-B.Tech.-I-Sem.

Subject Code: CS-PCC-216

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO4	PO5
CO1	construct databases using SQL commands	3	3
CO2	apply normalization techniques to eliminate redundancy	3	3
CO3	design a database schema for a given domain	3	3
CO4	solve queries based on joins, nested queries and aggregate functions	3	3
CO5	execute PL / SQL programs for a given application	3	3

DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION LAB

II-B.Tech.-I-Sem.

Subject Code: ESC-212

L T P C

- - 3 1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	design logic gates using NAND and NOR gates	3	3
CO2	construct the combinational and sequential logic circuits	3	3
CO3	solve simple problems using ALP	3	3
CO4	implement string handling operations using ALP	3	3
CO5	develop programs using procedures and macros	3	3

GENDER SENSITIZATION LAB (MANDATORY COURSE- NON- CREDIT)

II-B.Tech.-I-Sem.

Subject Code: MC-201

L T P C

- - 2 -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

NUMERICAL AND STATISTICAL METHODS

II-B.Tech.-II-Sem.

Subject Code: BSC-201

L T P C

3 1 - 4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve transcendental, linear and non-linear system of equations using numerical methods	3	2	1
CO2	find the numerical solutions for first order initial value problems and integrals	3	2	1
CO3	differentiate among random variables involved in the probability models	3	2	1
CO4	test hypothesis for small and large samples	3	2	1
CO5	identify the correlation coefficients, strength, direction and significance level	3	2	1

FORMAL LANGUAGES AND AUTOMATA THEORY

II-B.Tech.-II-Sem.

L T P C



Subject Code: CS-PCC-221

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the concepts of formal languages and finite automata techniques	3	3	3	2
CO2	design various finite automata and its conversion	3	3	3	2
CO3	build finite automata for different regular expressions and languages	3	3	3	2
CO4	summarize context free grammar and construction of PDA	3	3	3	2
CO5	construct turing machines and analyze undecidability	3	3	3	2

SOFTWARE DESIGN AND ENGINEERING

II-B.Tech.-II-Sem.

Subject Code: CS-PCC-222

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO11	PO12	PO13
CO1	identify & analyze software requirements and prepare SRS	3	3	3	3	3	3
CO2	design a system, component or process to meet the needs	3	3	3	3	3	3
CO3	make use of UML diagrams in software design	3	3	3	3	3	3
CO4	analyze various testing techniques by using various metrics	3	3	3	3	3	3
CO5	adapt risk management strategies to assure software quality	3	2	3	3	3	3

OPERATING SYSTEMS

II-B.Tech.-II-Sem.

Subject Code: CS-PCC-223

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	outline various concepts operating systems and Linux utilities	3	3	2
CO2	solve synchronization problems by using process management and API s	3	3	2
CO3	adapt various deadlock handling and memory management mechanism	3	3	2
CO4	analyze various file management system	3	3	2
CO5	make use of I/O Management and security mechanisms	3	3	2

COMPUTER NETWORKS

II-B.Tech.-II-Sem.

Subject Code: CS-PCC-224

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PO13
CO1	outline the basics of computer networks and various layers	3	3	2	3
CO2	demonstrate multiple access protocols	3	3	2	3
CO3	interpret network layer and routing algorithms	3	3	3	3
CO4	illustrate internetworking and various transport protocols	3	3	3	3
CO5	make use of various protocols of application layer	3	3	2	3



OPERATING SYSTEMS (Linux) LAB

II-B.Tech.-II-Sem.

Subject Code: CS-PCC-225

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO5	PO14
CO1	interpret various CPU scheduling algorithms and file allocation methods	3	3	3
CO2	experiment with File organization and memory management	3	3	3
CO3	distinguish Deadlock Avoidance and Deadlock Prevention	3	3	3
CO4	compare different page replacement and disk scheduling techniques	3	3	3
CO5	design and develop solutions for using system calls and implementing IPCs	3	3	3

COMPUTER NETWORKS LAB

II-B.Tech.-II-Sem.

Subject Code: CS-PCC-226

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	make use of NS2/NS3 tools in computer networks	3	3	3
CO2	outline the concepts of network models and components	3	3	3
CO3	Adapt various data link layer algorithms and protocols	3	3	3
CO4	illustrate various network layer algorithms and protocols	3	3	3
CO5	demonstrate various transport layer algorithms and protocols	3	3	3

INTERNET OF THINGS LAB

II-B.Tech.-II-Sem.

Subject Code: CS-PCC-227

L T P C

1 - 2 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO14
CO1	improve working on basic IoT devices	3	3	3	3	3	3	3	3
CO2	determine learning and utilization of IoT devices	3	3	3	3	3	3	3	3
CO3	develop automation work-flow in IoT enabled environment	3	3	3	3	3	3	3	3
CO4	recommend working on advance IoT Systems	3	3	3	3	3	3	3	3
CO5	take part in practicing and monitoring remotely	3	3	3	3	3	3	3	3

COMPUTATIONAL MATHEMATICS LAB USING Sci LAB

II-B.Tech.-II-Sem.

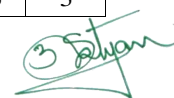
Subject Code: BSC-203

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO14
CO1	solve problems on Linear Algebra and plotting of Graphs	3	3	3	3
CO2	find roots of an equation using various Methods	3	3	3	3
CO3	fit a curve for straight line, parabola, exponential and power curves	3	3	3	3



CO4	solve ordinary differential equations using Numerical techniques	3	3	3	3
CO5	solve ordinary integral equations using Numerical techniques	3	3	3	3

ENVIRONMENTAL SCIENCES MANDATORY COURSE (NON-CREDIT)

II-B.Tech.-II-Sem.

Subject Code: MC-202

L T P C

2 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2

DESIGN & ANALYSIS OF ALGORITHMS

III-B.Tech.-I-Sem.

Subject Code: CS-PCC-311

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PO13
CO1	measure time and space complexity of algorithms	3	3	3	3
CO2	solve problems using disjoint sets and divide-and-conquer techniques	3	3	2	2
CO3	apply greedy method and dynamic programming paradigm to solve the problems	3	3	2	2
CO4	adapt back-tracking and branch-bound methods to solve problems	3	3	2	2
CO5	interpret NP-hard and NP-complete problems	3	3	2	2

COMPILER DESIGN

III-B.Tech.-I-Sem.

Subject Code: CS-PCC-312

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	illustrate the various phases of compiler	3	3	3	2	2
CO2	construct top down and bottom up parsers	3	3	3	2	2
CO3	adapt intermediate Code Generation techniques and run-time storage allocation strategies	3	3	3	2	2
CO4	simplify the code using code optimization techniques	3	3	3	2	2
CO5	apply generic code generation algorithm to generate target code	3	3	3	2	2

DATA MINING AND ANALYTICS

III-B.Tech.-I-Sem.

L T P C



Subject Code: CS-PCC-313

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO13
CO1	summarize fundamentals of data mining	3	2	2	2	2
CO2	illustrate various mining association rules	3	3	2	2	3
CO3	make use of classification and clustering techniques	3	3	3	2	3
CO4	outline various data analytics techniques	3	2	2	2	3
CO5	solve statistical problems using R programming	3	3	3	3	3

WEB TECHNOLOGIES

III-B.Tech.-I-Sem.

Subject Code: CS-PCC-314

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	apply the design principles of HTML and Java Script to create static and dynamic web pages	3	2	2	3	3
CO2	develop server side scripting with PHP language	3	2	2	3	3
CO3	illustrate server side programming with java Servlets	3	3	3	3	3
CO4	demonstrate server side programming with java JSP	3	3	3	3	3
CO5	design web application using MVC	3	3	3	3	3

ARTIFICIAL INTELLIGENCE

III-B.Tech.-I-Sem.

Subject Code: CS-PCC-315

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12	PO13
CO1	explain the concepts of artificial intelligence	3	3	3	3	2	3
CO2	illustrate various search algorithms	3	3	3	3	2	3
CO3	adapt various probabilistic reasoning approaches	3	3	2	3	3	3
CO4	elaborate Markov decision process	3	3	2	3	2	3
CO5	perceive various reinforcement learning approaches	3	3	2	3	3	3

DATA MINING AND ANALYTICS LAB

III-B.Tech.-I-Sem.

Subject Code: CS-PCC-316

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	make use of open source data mining and analytic tools	3	3	3
CO2	examine the interesting insights of Apriori algorithm using WEKA	3	3	3
CO3	demonstrate the classification and clustering techniques	3	3	3
CO4	analyze the concepts of data analytics and statistical testing methods	3	3	3
CO5	compare various kinds of regression techniques	3	3	3

WEB TECHNOLOGIES LAB

III-B.Tech.-I-Sem.

Subject Code: CS-PCC-317

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	design web pages using HTML, CSS and JavaScript	3	3	3
CO2	build web application using PHP and MySQL	3	3	3
CO3	create web application using PHP and XML	3	3	3
CO4	develop web application using servlets and JDBC	3	3	3
CO5	construct web application using JSP and JDBC	3	3	3

ARTIFICIAL INTELLIGENCE LAB

III-B.Tech.-I-Sem.

Subject Code: CS-PCC-318

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	illustrate various search techniques	3	3	3
CO2	solve real-time problems using graph theory	3	3	3
CO3	develop various games using AI techniques	3	3	3
CO4	adapt Bayesian probability model	3	3	3
CO5	design programs based on Markov decision process	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

III-B.Tech.-I-Sem.

Subject Code: HSMC-301

L T P C

1 - 2 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3

EMPLOYABILITY SKILLS – I MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-I-Sem.

Subject Code: MC-311

L T P C

3 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3
CO3	build proficiency in quantitative reasoning	3	3



CO4	improve critical thinking skills	3	3
CO5	exhibit confidence in facing the interview process	3	3

SUMMER INTERNSHIP - I MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-I-Sem.

Subject Code: MC-312

L T P C

- - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

CLOUD COMPUTING

III-B.Tech.-II-Sem.

Subject Code: CS-PCC-321

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO13
CO1	explain various computing paradigms	3	2	3	2	2
CO2	illustrate fundamentals of cloud computing	3	2	3	2	2
CO3	elaborate cloud computing architecture and management	3	3	3	2	2
CO4	perceive various cloud service models	3	3	3	2	2
CO5	select various cloud service providers	3	2	3	2	2

MACHINE LEARNING AND DATA SCIENCES

III-B.Tech.-II-Sem.

Subject Code: CS-PCC-322

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	demonstrate the required mathematical foundations for ML& DS	3	3	3	3	3
CO2	outline the functionalities of machine learning	3	3	3	3	3
CO3	illustrate learning algorithms & data science basics	3	3	2	2	3
CO4	build data science applications using Python based toolkits	3	3	3	3	3
CO5	use recommender systems and sentiment analysis in real time applications	3	3	3	3	3

FULL STACK WEB DEVELOPMENT

III-B.Tech.-II-Sem.

Subject Code: CS-PCC-323

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PO13
CO1	explain the concepts of full stack web development	3	2	2	3	3
CO2	illustrate High level programming and jQuery concepts	3	2	2	3	3
CO3	make use of Node.js and MongoDB Driver for web development	3	3	3	3	3
CO4	develop app using angularJS concepts	3	3	3	3	3
CO5	establish version control in GitHub	3	2	3	3	3

ADVANCED ALGORITHMS (Professional Elective - I)

III-B.Tech.-II-Sem.
Subject Code: CS-PEC-301

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	outline various analysis techniques for algorithms	3	3	2	2	3
CO2	develop applications using graph algorithms	3	3	3	3	3
CO3	analyze different number-theoretic algorithms	3	3	3	3	3
CO4	illustrate string-matching, probabilistic & randomized algorithms	3	3	3	3	3
CO5	solve problems using NP-Completeness & Approximate algorithms	3	3	3	3	3

DISTRIBUTED SYSTEMS (Professional Elective - I)

III-B.Tech.-II-Sem.
Subject Code: CS-PEC-302

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO12	PO13
CO1	perceive various architectures used to design distributed systems	3	2	2	2
CO2	build distributed systems using various inter process communication techniques	3	3	2	2
CO3	evaluate distributed algorithms for clock synchronization	3	3	2	2
CO4	analyze the role of middleware using RPC,RMI and design a name server	3	2	2	2
CO5	apply fault tolerant techniques to improve concurrency	3	3	3	2

DIGITAL MARKETING (Professional Elective - I)

III-B.Tech.-II-Sem.
Subject Code: CS-PEC-303

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	outline the importance of digital marketing	2	1	2	3	3	3
CO2	use search engine optimization to achieve business goals	3	2	3	3	3	3
CO3	adapt social media for business promotion	3	3	3	3	3	3
CO4	identify link building techniques for content consideration	3	2	3	3	3	3
CO5	apply digital marketing techniques in real time applications	3	3	3	3	3	3



BLOCKCHAIN TECHNOLOGY
(Professional Elective - I)

III-B.Tech.-II-Sem.
Subject Code: CS-PEC-304

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PO13
CO1	explain the fundamentals of Blockchain techniques	3	2	2	3	3	3
CO2	analyze various consensus problems	3	3	3	3	2	3
CO3	adapt Blockchain technology to improve business	3	3	3	3	2	3
CO4	make use of Ethereum frameworks to write smart contract	3	3	3	3	2	3
CO5	interpret Blockchain technology in real time applications	3	3	3	3	2	3

DISASTER MANAGEMENT
(Open Elective - I)

III-B.Tech.-II-Sem.
Subject Code: OEC-301

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

FUNDAMENTALS OF OPERATIONS RESEARCH
(Open Elective-I)

III-B.Tech.-II-Sem.
Subject Code: OEC-302

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	formulate and solve linear programming problem using various methods	3	2	3
CO2	solve transportation and assignment problems	3	3	3
CO3	compute sequencing and inventory model problems	2	2	3
CO4	analyze waiting lines and game theory problems	3	3	3
CO5	evaluate replacement and dynamic programming problems	2	3	3

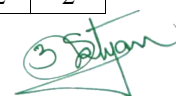
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Open Elective-I)

III-B.Tech.-II-Sem.
Subject Code: OEC-303

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2



CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

JAVA PROGRAMMING (Open Elective-I)

III-B.Tech.-II-Sem.

Subject Code: OEC-304

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	create packages and interfaces	3	2	3	3	2
CO4	build efficient code using multithreading and exception handling	3	2	3	3	2
CO5	design real-time applications using applets	3	2	3	3	2

INDIAN CULTURE AND CONSTITUTION (Open Elective-I)

III-B.Tech.-II-Sem.

Subject Code: OEC-305

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	1
CO2	explain features of languages, religions and holy books	3	2
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	2

CLOUD COMPUTING LAB

III-B.Tech.-II-Sem.

Subject Code: CS-PCC-324

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	analyze the use of Cloud Applications	3	3	3
CO2	create virtual machines from available physical resources	3	3	3
CO3	demonstrate the benefits of various cloud computing platforms	3	3	3
CO4	make use of modern tools to built cloud applications	3	3	3
CO5	design and develop application using AWS	3	3	3

MACHINE LEARNING AND DATA SCIENCES LAB

III-B.Tech.-II-Sem.

Subject Code: CS-PCC-325

L T P C

- - 2 1



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	illustrate the implementation procedures for the ML algorithms	3	3	3
CO2	demonstrate the ID3 classification algorithms	3	3	3
CO3	analyze k-Means clustering on different datasets	3	3	3
CO4	apply predictive algorithms on live data	3	3	3
CO5	identify the regression algorithms to solve real world problems	3	3	3

FULL STACK WEB DEVELOPMENT LAB

III-B.Tech.-II-Sem.

Subject Code: CS-PCC-326

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	illustrate implementation procedure of full stack web development	3	3	3
CO2	demonstrate HTML5, CSS5 scripting languages and Github	3	3	3
CO3	make use of scripting languages in web development	3	3	3
CO4	develop web applications using AJAX	3	3	3
CO5	build real time applications using full stack web development	3	3	3

MOBILE APPLICATION DEVELOPMENT (ANDROID) LAB

III-B.Tech.-II-Sem.

Subject Code: CS-PCC-327

L T P C

1 - 2 2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak; 0-No Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO8	PO14
CO1	outline installation of android application development kit	3	3	3	3	3	3
CO2	develop android applications for mobile devices	3	3	3	3	3	3
CO3	build GUI based android applications	3	3	3	3	3	3
CO4	appraise graphics and multimedia support in android	3	3	3	3	3	3
CO5	create database driven mobile applications	3	3	3	3	3	3

EMPLOYABILITY SKILLS – II MANDATORY COURSE (NON-CREDIT)

III-B.Tech.-II-Sem.

Subject Code: MC-321

L T P C

3 - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	make use of soft skills to become a professional team member	3	3
CO2	develop professional correspondence skills	3	3
CO3	apply knowledge of decision making, leadership, motivation	3	3
CO4	adapt principles of quantitative aptitude to achieve qualitative results	3	3
CO5	exhibit confidence in facing the interview process	3	3

MANAGEMENT, ECONOMICS AND ACCOUNTANCY



IV-B.Tech.-I-Sem.
Subject Code: HSMC-401

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	apply principles of management in professional career	3	2
CO2	make use of principles of economics for decision making	3	2
CO3	solve problems in the areas of production, cost and price	3	2
CO4	prepare balance sheet and maintain books of accounts	2	3
CO5	analyze financial performance of an enterprise	3	3

INFORMATION SECURITY

IV- B.Tech.-I-Sem.
Subject Code: CS-PCC-411

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PO13
CO1	perceive basic cryptographic algorithms, message and web authentication and security issues	2	2	2	3	2	3
CO2	identify security system requirements for both of them such as client and server	3	3	3	3	3	3
CO3	design various cryptographic algorithms	3	3	3	3	3	3
CO4	illustrate a network and flow of information	3	3	3	3	3	3
CO5	make use of security key management in network security	3	3	3	3	3	3

SOFTWARE TESTING METHODOLOGIES
(Professional Elective-II)

IV-B.Tech.-I-Sem.
Subject Code: CS-PEC-401

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO12	PO13
CO1	explain the concepts of STM, flow graphs and path testing	3	2	2	3	3
CO2	illustrate domain testing mechanism	3	3	3	3	3
CO3	distinguish transaction and data flow testing methods	3	3	3	3	3
CO4	make use of paths, products, expressions and logical testing strategies	3	3	3	3	3
CO5	apply transition testing and graph matrices to solve real time problems	3	3	3	3	3

ADVANCED COMPUTER ARCHITECTURE
(Professional Elective - I)

IV-B.Tech.-I-Sem.
Subject Code: CS-PEC-405

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO12	PO13
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CO1	explain the fundamentals of computer design	2	2	2	2
CO2	outline instruction-level parallelism (ILP) and its challenges	2	2	2	3
CO3	perceive memory hierarchy, multiprocessors and thread-level parallelism	3	3	2	3
CO4	illustrate various storage systems and its reliability measures	3	3	3	3
CO5	adapt software and hardware multithreading techniques	3	3	3	3

NATURAL LANGUAGE PROCESSING (Professional Elective - II)

IV-B.Tech.-I-Sem.

Subject Code: CS-PEC-409

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PO13
CO1	explain fundamentals of NLP and morphology	3	2	3	3	3	3
CO2	demonstrate word level statements and syntactic analysis	3	2	3	3	3	3
CO3	make use of context free grammar and parsing techniques	3	3	3	3	3	3
CO4	apply semantic analysis techniques to solve various problems	3	3	3	3	3	3
CO5	illustrate language generation and discourse analysis	3	2	3	3	3	3

VIRTUAL REALITY (Professional Elective - II)

IV-B.Tech.-I-Sem.

Subject Code: CS-PEC-413

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PO13
CO1	explain fundamental of virtual reality and 3D graphic systems	2	2	2	2	2	3
CO2	adapt geometric modeling in virtual reality environment	3	3	3	3	3	3
CO3	make use of virtual environment for animation and simulation	3	3	3	3	3	3
CO4	illustrate virtual reality hardware and software	3	2	3	3	2	3
CO5	develop virtual reality applications	3	3	3	3	3	3

QUANTUM COMPUTING (Professional Elective - III)

IV-B.Tech.-I-Sem.

Subject Code: CS-PEC-402

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12	PO13
CO1	explain the concepts of quantum computing	3	2	2	2	2	3
CO2	make use of mathematical foundations for quantum computing	3	3	3	2	2	3
CO3	outline the architecture and programming models	3	2	2	2	3	3
CO4	utilize basic techniques of quantum computing	3	3	3	3	2	3
CO5	elaborate major algorithms and discuss about OSS toolkits	3	3	3	3	3	3

ADHOC AND SENSOR NETWORKS



(Professional Elective - III)

IV-B.Tech.-I-Sem.
Subject Code: CS-PEC-406

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	explain the concepts of adhoc and sensor networks	3	2	2	2	3
CO2	apply QoS for secure MANETs	3	3	3	3	3
CO3	illustrate load distribution and routing protocol in MANETs	3	3	3	2	3
CO4	utilize power management and time synchronization techniques in WSN	3	3	3	3	3
CO5	adapt wi-fi for Adhoc networks	3	2	2	3	3

INFORMATION RETRIEVAL SYSTEMS
(Professional Elective - III)

IV-B.Tech.-I-Sem.
Subject Code: CS-PEC-410

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PO13
CO1	outline information retrieval strategies	3	2	2	3	3
CO2	make use of various retrieval utilities for improving search	3	3	3	3	3
CO3	illustrate CLIR and its efficiency	3	3	3	3	3
CO4	formulate queries for semi-structured data	3	3	3	3	3
CO5	demonstrate distributed Information retrieval data	3	3	3	3	3

ETHICAL HACKING
(Professional Elective - III)

IV-B.Tech.-I-Sem.
Subject Code: CS-PEC-414

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PO13
CO1	explain framework & security issues related to ethical hacking	3	2	2	3	2	3
CO2	plan and execute controlled attacks to safeguard the business	3	3	3	3	2	3
CO3	identify security lapses and prepare for an ethical hack	3	3	3	3	3	3
CO4	make use of enumeration and exploitation techniques	3	3	3	3	2	3
CO5	adapt best practices for deliverables and integration for security	3	3	3	3	3	3

ENVIRONMENTAL IMPACT ASSESSMENT
(Open Elective-II)

IV-B.Tech.-I-Sem.
Subject Code: OEC-401

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO10	PO12
CO1	identify the attributes to be considered for EIA	3	3	3	3

CO2	assess impact of deforestation	3	3	3	3
CO3	interpret impact prediction, significance of soil quality and mitigation	3	3	2	3
CO4	conduct environmental audit and prepare reports	3	3	2	3
CO5	illustrate environmental policies and provisions	3	3	3	3

NON-CONVENTIONAL ENERGY SOURCES (Open Elective-II)

IV-B.Tech.-I-Sem.

Subject Code: OEC-403

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO12
CO1	analyze global and national energy scenarios	3	3	3
CO2	illustrate the various solar energy systems	3	3	3
CO3	demonstrate the aspects related to wind energy power plants	3	3	3
CO4	build the power plants using bio gas	3	3	3
CO5	estimate the power generation in hydroelectric plants	3	3	3

PRINCIPLES OF COMMUNICATION SYSTEMS (Open Elective-II)

IV-B.Tech.-I-Sem.

Subject Code: OEC-405

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the fundamentals of communication systems	3	2	2	2
CO2	analyze various analog modulation and demodulation schemes	3	3	3	2
CO3	explain sampling theorem, pulse modulation and multiplexing techniques	3	3	3	2
CO4	illustrate digital modulation schemes	3	3	2	2
CO5	develop source and channel coding techniques	3	3	3	2

DATABASE MANAGEMENT SYSTEMS (Open Elective-II)

IV-B.Tech.-I-Sem.

Subject Code: OEC-407

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2

INTELLECTUAL PROPERTY RIGHTS (Open Elective-II)

IV-B.Tech.-I-Sem.

L T P C



Subject Code: OEC-409

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO8	PO10	PO12
CO1	outline basics of intellectual property law	3	3	2	3	3
CO2	identify the various trademarks	3	3	2	3	3
CO3	analyze patent and copy rights law	3	3	3	3	3
CO4	differentiate trade secret and unfair practice	3	3	3	3	3
CO5	summarize new developments in Intellectual Property Rights	3	3	3	3	3

TECHNICAL WRITING SKILLS LAB

IV-B.Tech.-I-Sem.

Subject Code: HSMC-402

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	make use of language for understanding discourse and make notes	3	3
CO2	demonstrate command over using library resources for academic and other pursuits	3	3
CO3	apply knowledge of English language for creative and academic purposes	3	3
CO4	adapt principles in conveying good professional ethics	3	3
CO5	exhibit thorough awareness on research-oriented activities and career development	3	3

INFORMATION SECURITY LAB

IV-B.Tech.-I-Sem.

Subject Code: CS-PCC-412

L T P C

- - 2 1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO14
CO1	make use of open source tools to analyze information security	3	3	3
CO2	develop various cryptographic substitution techniques	3	3	3
CO3	implement symmetric key cryptographic algorithms	3	3	3
CO4	experiment with various public key cryptosystems	3	3	3
CO5	adapt MD5 algorithm to prevent authentication related problems	3	3	3

PROJECT - I

IV-B.Tech.-I-Sem.

Subject Code: CS-PRJ-413

L T P C

- - 6 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3



**SUMMER INTERNSHIP - II
MANDATORY COURSE (NON-CREDIT)**

IV-B.Tech.-I-Sem.
Subject Code: MC-411

L T P C
- - - -

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

**SOFTWARE PROJECT MANAGEMENT
(Professional Elective - IV)**

IV-B.Tech.-II-Sem.
Subject Code: CS-PEC-403

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO11	PO12	PO13
CO1	outline the concepts of software management and economics	3	2	2	2	3	3
CO2	illustrate artifacts and life cycle phases	3	3	3	2	3	3
CO3	design various workflows and process planning	3	3	3	3	3	3
CO4	adapt automated project planning and control	3	3	3	3	3	3
CO5	apply contemporary software project management practices	3	3	3	3	3	3

**COMPUTATIONAL BIOLOGY
(Professional Elective – IV)**

IV-B.Tech.-II-Sem.
Subject Code: CS-PEC-407

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO6	PO12	PO13
CO1	perceive the history and scope of computational biology	3	3	2	2	2	3
CO2	make use of biological databases and tools	3	3	3	3	3	3
CO3	outline the concepts sequence alignment and NGS	3	3	3	3	2	3
CO4	illustrate predictive methods & protein sequences	3	3	3	3	3	3
CO5	explain drug discovery process	3	3	3	3	3	3

**CYBER-PHYSICAL SYSTEMS
(Professional Elective – IV)**

IV-B.Tech.-II-Sem.
Subject Code: CS-PEC-411

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PO13
CO1	outline the necessity of cyber physical system	3	2	2	3	2	3
CO2	analyse the future challenges & social impact of CPS	3	3	3	3	3	3
CO3	illustrate the computing fundamentals of CPS	3	3	3	2	2	3
CO4	demonstrate the applications & system requirements of CPS	3	3	3	2	3	3
CO5	appraise various applications of CPS	3	3	3	3	3	3

COGNITIVE COMPUTING (Professional Elective –IV)

IV-B.Tech.-II-Sem.

Subject Code: CS-PEC-415

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PO6	PO12	PO13
CO1	explain the fundamentals of cognition systems	3	3	2	2	2	3	2	3
CO2	apply cognitive computing in day to day life	3	3	3	3	3	3	3	3
CO3	analyze various functions and resources of cognitive computing	3	3	3	3	3	3	3	3
CO4	classify mental states, perception and sensing	3	3	3	3	3	3	2	3
CO5	appraise various applications of cognitive computing	3	3	3	3	3	3	3	3

COMPUTER FORENSICS (Professional Elective - V)

IV-B.Tech.-II-Sem.

Subject Code: CS-PEC-404

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PO13
CO1	explain the fundamentals of computer forensics	3	2	2	3	3	3
CO2	illustrate the methods for evidence collection and data seizure	3	3	3	3	3	3
CO3	analyze and validate digital forensic evidences	3	3	3	3	3	3
CO4	solve the computer fraud cases using forensics tools	3	3	3	3	3	3
CO5	make use of various operating systems for computer forensics	3	3	3	3	3	3

DIGITAL IMAGE PROCESSING (Professional Elective –V)

IV-B.Tech.-II-Sem.

Subject Code: CS-PEC-408

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PO13
CO1	explain image fundamentals and transforms	3	3	3	2	3
CO2	utilize image enhancement and color image processing techniques	3	3	3	2	3
CO3	make use of image restoration techniques and wavelets	3	3	3	2	3
CO4	apply image segmentation techniques and morphological image processing	3	3	3	2	3
CO5	analyze image compression techniques	3	3	3	2	3



NEURAL NETWORKS AND DEEP LEARNING
(Professional Elective - V)

IV-B.Tech.-II-Sem.

Subject Code: CS-PEC-412

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PO13
CO1	illustrate the functionalities of Neural Networks and Learning process	3	3	2	3	3	3
CO2	analyze the single-layer and multi-layer perceptrons	3	3	3	3	3	3
CO3	interpret the deep feed forward networks along with regularization	3	3	3	3	3	3
CO4	demonstrate the convolutional neural networks in deep learning	3	3	3	3	3	3
CO5	outline the importance of autoencoders	3	2	2	3	3	3

CYBER SECURITY
(Professional Elective - V)

IV-B.Tech.-II-Sem.

Subject Code: CS-PEC-416

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO4	PO5	PO6	PO8	PO12	PO13
CO1	explain cyber security terminologies	2	2	2	2	2	2	2
CO2	identify various cyber offences	3	3	3	3	3	3	3
CO3	apply various tools and methods to control cybercrime	3	3	3	3	3	3	3
CO4	make use of standards and cyber laws to enhance cyber security	3	3	3	3	3	3	3
CO5	illustrate the importance of security policies & IT Act	3	3	2	3	3	3	3

GREEN BUILDING TECHNOLOGIES
(Open Elective-III)

IV-B.Tech.-II-Sem.

Subject Code: OEC-402

L T P C

3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO7	PO12
CO1	explain the fundamentals of energy use and processes in building	3	2	2	2
CO2	identify indoor environmental requirement and its management	3	3	3	2
CO3	assess the impact of solar radiation on buildings	3	3	3	2
CO4	evaluate end-use energy utilization and requirements	3	3	2	2
CO5	adapt audit procedures for energy management	3	3	3	2

FUNDAMENTALS OF ROBOTICS
(Open Elective-III)

IV-B.Tech.-II-Sem.

Subject Code: OEC-404

L T P C

3 - - 3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2
CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate mechanical and electrical hardware for robot with feedback control	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

FUNDAMENTALS OF EMBEDDED SYSTEMS (Open Elective – III)

IV-B.Tech.-II-Sem.

Subject Code: OEC-406

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	outline the basic concepts of embedded computing	3	3	2	2
CO2	illustrate the architecture of 8051 microcontroller	3	3	3	2
CO3	develop embedded programs using 8051 microcontroller	3	3	3	2
CO4	demonstrate 8051 microcontroller interface with peripherals	3	3	3	2
CO5	explain real time operating system concepts	3	3	3	3

WEB TECHNOLOGIES (Open Elective – III)

IV-B.Tech.-II-Sem.

Subject Code: OEC-408

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2

PRINCIPLES OF ENTREPRENEURSHIP (Open Elective – III)

IV-B.Tech.-II-Sem.

Subject Code: OEC-410

L T P C
3 - - 3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3



PROJECT - II

IV-B.Tech.-II-Sem.
Subject Code: CS-PRJ-421

L T P C
- - 22 11

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO14
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3

Academic Regulations (R20)
B.Tech. - Regular Four Year Degree Programme (CSE)
(For batches admitted from the academic year 2020 - 21)
Department of Computer Science and Engineering

LINEAR ALGEBRA & CALCULUS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-101	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	analyze the nature of sequences and series	3	2	1
CO4	verify mean value theorems and evaluate improper integrals by using Beta and Gamma functions	3	2	1
CO5	find the extreme values of functions of two variables	3	2	1

APPLIED PHYSICS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-103	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the principles of Quantum Mechanics	3	2	1
CO2	analyze various electron theories of conduction in solids	3	2	1
CO3	classify semiconductors and relate functioning of semiconductor devices	3	2	1
CO4	illustrate principles and applications of lasers and optical fibers	3	2	1
CO5	outline dielectric and magnetic properties of materials	3	2	1

ENGLISH FOR ENGINEERS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-HSMC-101	2	-	-	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in RAWLS skills	3	1
CO2	demonstrate the acquired language in written and spoken contexts	3	1
CO3	express, restate and respond appropriately by comprehending the given data	3	1
CO4	develop proficiency to succeed in academic activities, research and career	3	1
CO5	excel in professional and social etiquette	3	1

PROBLEM SOLVING WITH C PROGRAMMING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-103	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
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CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

COMPUTER AIDED ENGINEERING GRAPHICS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-107	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2

APPLIED PHYSICS LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-104	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	demonstrate the electrical properties of a semiconductor	3
CO2	compare practical results with theoretical calculations in electrical circuits	3
CO3	demonstrate the properties of lasers and optical fibers	3
CO4	find the energy gap of a semiconductor and identify its band structure	3
CO5	examine electrical resonance in LCR circuits	3

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-HSMC-102	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	identify the nuances of the language through multimedia experience	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3
CO4	develop speaking and listening skills	3	3
CO5	appraise communication and correspond effectively	3	3

PROBLEM SOLVING WITH C PROGRAMMING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-104	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3
CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3

NATIONAL SERVICE SCHEME (NSS)/PHYSICAL EDUCATION/YOGA MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-MC-101	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO9	PO12
CO1	harness physical literacy and lifelong engagement	3	3	3	3	3
CO2	use aesthetic appreciation	2	1	2	3	3
CO3	build competence and confidence to face challenges	1	2	1	3	3
CO4	develop Sports related values and attitudes	3	3	2	2	3
CO5	follow appropriate etiquette and sports	1	1	2	3	3

ADVANCED CALCULUS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-102	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve linear and non-linear partial differential equations	3	2	1
CO3	evaluate the line, surface and volume integrals and convert them from one to another by using multiple integrals	3	2	1
CO4	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

ENGINEERING CHEMISTRY

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-105	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1
CO4	illustrate the various fuels, synthesis of polymers and drugs	3	2	1
CO5	analyze the properties of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Course	B.Tech.-II-Sem.	L	T	P	C
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35/2/2020

Subject Code	20-ESC-101	3	-	-	3
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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	elaborate the concepts of network theorems & single phase AC circuits	3	3	2	1
CO3	explain three phase AC circuits and P-N Junction Diode	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1

DATA STRUCTURES THROUGH C

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-105	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	classify different data structures to design efficient programs	3	3	2	2
CO2	identify appropriate sorting and searching techniques	3	2	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	explain various concepts of non-linear data structures	3	3	2	2
CO5	choose an appropriate hashing technique for a given problem	3	3	2	2

ENGINEERING CHEMISTRY LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-106	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	determine the hardness in water samples to solve societal problems	3
CO2	estimate the strength of the given solutions	3
CO3	analyze adsorption and viscosity of various fluids	3
CO4	synthesize the various organic compounds used in medical industry	3
CO5	verify and understand the distribution coefficient	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-102	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws	3
CO2	evaluate network theorems	3
CO3	verify the V-I characteristics of various electronic devices	3
CO4	determine the efficiency of various rectifiers	3
CO5	illustrate the configurations of Bi-polar junction transistor	3

DATA STRUCTURES THROUGH C LAB



Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-106	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	implement various searching and sorting techniques	3
CO2	demonstrate basic operations of stack and queues using arrays and linked lists	3
CO3	apply stack data structure to solve various computing problems	3
CO4	demonstrate and apply different methods for traversing graphs	3
CO5	construct binary search tree	3

IT & ENGINEERING WORKSHOP PRACTICE

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-108	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	execute simple programs using Sci Lab	3	3	2	2
CO2	design programs using conditional statements and loops	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2

ENVIRONMENTAL SCIENCE MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-MC-102	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2

STATISTICAL FOUNDATIONS FOR COMPUTER SCIENCE

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-BSC-201	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the concepts of probability and random variables	3	2	1
CO2	illustrate the importance of discrete, continuous and sampling distributions	3	2	1
CO3	use various estimation methods and test hypothesis for large samples	3	2	1
CO4	test hypothesis for small samples and find correlation/regression analysis	3	2	1
CO5	apply the theory of stochastic processes to analyze classification of states	3	2	1



DISCRETE MATHEMATICS & GRAPH THEORY

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-208	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	verify logical statements using connectives	3	3	2
CO2	validate arguments using predicate calculus	3	3	2
CO3	perform various operations with relational algebra	3	3	2
CO4	solve problems using combinatorics	3	3	2
CO5	simplify real-life situations using graph theory	3	3	3

DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-209	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12
CO1	interpret number systems and logical functions using K-Maps	3	3	2	2	2
CO2	design various combinational and sequential circuits	3	3	2	2	3
CO3	illustrate computer components and function of 8086 processor	3	3	2	2	2
CO4	analyze arithmetic operations and I/O operations	3	3	2	2	3
CO5	distinguish various memories and pipelining operations	3	3	2	2	3

DATABASE MANAGEMENT SYSTEMS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CS-PC-211	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design simple databases using basic concepts of database architectures	3	3	3	2
CO2	construct databases using ER Modelling	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	2
CO4	apply normalization on database to eliminate redundancy	3	3	3	2
CO5	illustrate the mechanisms of transaction management, concurrency control and recovery system	3	3	3	2

PYTHON PROGRAMMING

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CS-PC-212	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	perceive the fundamentals of python programming	3	3	2	2
CO2	develop programs using control statements	3	3	2	2
CO3	analyze the programming performances using functions	3	3	2	2
CO4	make use of collections in python programming	3	3	3	2



CO5	design classes and build error-free codes	3	3	3	3
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DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-210	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	design logic gates using NAND and NOR gates	3	3
CO2	construct the combinational and sequential logic circuits	3	3
CO3	solve simple problems using ALP	3	3
CO4	implement string handling operations using ALP	3	3
CO5	develop programs using procedures and macros	3	3

DATABASE MANAGEMENT SYSTEMS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CS-PC-213	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	construct databases using SQL commands	3	3
CO2	apply normalization techniques to eliminate redundancy	3	3
CO3	design a database schema for a given domain	3	3
CO4	solve queries based on joins, nested queries and aggregate functions	3	3
CO5	execute PL / SQL programs for a given application	3	3

PYTHON PROGRAMMING LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CS-PC-214	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	write simple programs using python	3	3
CO2	develop programs using control statements	3	3
CO3	implement functions and file I/O operations	3	3
CO4	make use of lists and tuples in python	3	3
CO5	design simple GUI programs	3	3

BUSINESS COMMUNICATION SKILLS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-HSMC-201	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3
CO3	make use of soft skills to become a professional team member	3	3
CO4	apply knowledge of decision making, leadership, motivation	3	3

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CO5	exhibit confidence in facing the interview process	3	3
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GENDER SENSITIZATION LAB (MANDATORY COURSE- NON- CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-MC-201	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

AUTOMATA AND COMPILER DESIGN

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-221	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design various finite automata	3	3	3	2
CO2	write a context free grammar for a given language	3	3	3	2
CO3	construct various parsers, semantics and intermediate code forms	3	3	3	2
CO4	implement code optimization techniques	3	3	3	2
CO5	apply generic code generation algorithm to generate target code	3	3	3	2

DESIGN & ANALYSIS OF ALGORITHMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-222	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	measure time and space complexity of algorithms	3	3	3	3
CO2	solve problems using disjoint sets and divide-and-conquer techniques	3	3	2	2
CO3	apply greedy method and dynamic programming paradigm to solve the problems	3	3	2	2
CO4	adapt back-tracking and branch-bound methods to solve problems	3	3	2	2
CO5	interpret NP-hard and NP-complete problems	3	3	2	2

OOP THROUGH JAVA

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-223	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple java programs using OOP concepts	3	3	2	2
CO2	interpret programs using the concepts of inheritance, polymorphism,	3	3	2	2



	packages and interfaces				
CO3	build efficient and error free codes using the concepts of multithreading and exception handling	3	3	3	3
CO4	design GUI programs using the concepts of AWT and event handling	3	3	3	2
CO5	develop real-time applications using applets and swings	3	3	3	3

COMPUTER NETWORKS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-224	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	outline the basics of computer networks and various layers	3	3	2	3
CO2	demonstrate multiple access protocols	3	3	2	3
CO3	interpret network layer and routing algorithms	3	3	3	3
CO4	illustrate internetworking and various transport protocols	3	3	3	3
CO5	make use of various protocols of application layer	3	3	2	3

OPERATING SYSTEMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-225	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	outline various concepts operating systems and Linux utilities	3	3	2
CO2	solve synchronization problems by using process management and API s	3	3	2
CO3	adapt various deadlock handling and memory management mechanism	3	3	2
CO4	analyze various file management system	3	3	2
CO5	make use of I/O Management and security mechanisms	3	3	2

OOP THROUGH JAVA LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-226	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	write, compile and execute simple java programs	3	3
CO2	develop programs using inheritance, polymorphism, packages and Interfaces	3	3
CO3	demonstrate multithreading and exception handling mechanisms	3	3
CO4	design GUI using the concepts of AWT and event handling	3	3
CO5	build real-time applications using applets and swings	3	3

OPERATING SYSTEMS (LINUX) LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-227	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO3	PO5	PSO2
CO1	illustrate Linux shell environment	3	3	3
CO2	create process using APIs	3	3	3
CO3	interpret various CPU scheduling algorithms and file allocation methods	3	3	3
CO4	experiment with page replacement and memory management	3	3	3
CO5	distinguish deadlock avoidance and deadlock prevention	3	3	3

APTITUDE AND CRITICAL THINKING SKILLS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-204	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	build proficiency in quantitative reasoning	3	3
CO2	improve critical thinking skills	3	3
CO3	enhance analytical skills	3	3
CO4	demonstrate quantitative aptitude concepts	3	3
CO5	adapt principles of quantitative aptitude to achieve qualitative results	3	3

SOCIAL INNOVATION LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-205	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	illustrate social innovation	3
CO2	identify the problems	3
CO3	choose suitable design processes	3
CO4	develop a prototype using suitable platform	3
CO5	prepare a report using project management techniques and ethics	3

INDIAN CULTURE AND CONSTITUTION MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-MC-202	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	1
CO2	explain features of languages, religions and holy books	3	2
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	2

SOFTWARE DESIGN AND ENGINEERING

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-311	3	-	-	3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO11	PO12	PSO1
CO1	identify & analyze software requirements and prepare SRS	3	3	3	3	3	3
CO2	design a system, component or process to meet the needs	3	3	3	3	3	3
CO3	make use of UML diagrams in software design	3	3	3	3	3	3
CO4	analyze various testing techniques by using various metrics	3	3	3	3	3	3
CO5	adapt risk management strategies to assure software quality	3	2	3	3	3	3

DATA MINING AND DATA ANALYTICS

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-312	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	summarize fundamentals of data mining	3	2	2	2	2
CO2	illustrate various mining association rules	3	3	2	2	3
CO3	make use of classification and clustering techniques	3	3	3	2	3
CO4	outline various data analytics techniques	3	2	2	2	3
CO5	solve statistical problems using R programming	3	3	3	3	3

INFORMATION AND CYBER SECURITY

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-313	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain information and cyber security terminologies	2	2	2	3	2	3
CO2	identify various cyber offences	3	3	3	3	3	3
CO3	apply cryptography for security networks	3	3	3	3	3	3
CO4	use standards and cyber laws to enhance cyber security	3	3	3	3	3	3
CO5	illustrate the importance of security policies & IT Act	3	3	3	3	3	3

ARTIFICIAL INTELLIGENCE

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-314	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12	PSO1
CO1	explain the concepts of artificial intelligence	3	3	3	3	2	3
CO2	illustrate various search algorithms	3	3	3	3	2	3
CO3	adapt various probabilistic reasoning approaches	3	3	2	3	3	3
CO4	elaborate Markov decision process	3	3	2	3	2	3
CO5	perceive various reinforcement learning approaches	3	3	2	3	3	3



SOFT COMPUTING (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PE-311	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	use search techniques in AI problems	3	2	2	2	2	3
CO2	describe various supervise learning techniques	3	2	3	3	2	3
CO3	apply special networks in soft computing problems	3	3	3	3	3	3
CO4	implement fuzzy systems in engineering applications	3	2	3	3	3	3
CO5	perform various operations of genetic algorithms	3	3	3	3	3	3

GAMIFICATION (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PE-312	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12	PSO1
CO1	outline the importance of Gamification	3	2	2	3	3	2	3
CO2	make use of game elements	3	3	3	3	3	2	3
CO3	adapt theories of Gamification	3	3	3	3	3	3	3
CO4	apply Gamification to various learning domains	3	3	3	2	3	3	3
CO5	interpret Alternate Reality Games for Corporate Learning	3	2	3	3	3	3	3

DIGITAL MARKETING (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PE-313	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	outline the importance of digital marketing	2	1	2	3	3	3
CO2	use search engine optimization to achieve business goals	3	2	3	3	3	3
CO3	adapt social media for business promotion	3	3	3	3	3	3
CO4	identify link building techniques for content consideration	3	2	3	3	3	3
CO5	apply digital marketing techniques in real time applications	3	3	3	3	3	3

INFORMATION AND CYBER SECURITY LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-316	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	explain concepts of cryptanalysis	3	3	3
CO2	Examine different vulnerability attacks	3	3	3



CO3	illustrate Wi-Fi security techniques	3	3	3
CO4	Able to do malware analysis.	3	3	3
CO5	Able to configure simple firewall and IT audit	3	3	3

ARTIFICIAL INTELLIGENCE LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-317	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	illustrate various search techniques	3	3	3
CO2	solve real-time problems using graph theory	3	3	3
CO3	develop various games using AI techniques	3	3	3
CO4	adapt Bayesian probability model	3	3	3
CO5	design programs based on Markov decision process	3	3	3

AUTOMATED TESTING TOOLS (SELENIUM) LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-318	1	-	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO8	PSO2
CO1	install JAVA, Associate SWD Jars and Browser drivers	3	2	2	3	3	3
CO2	devise website issues using automation	3	3	3	3	3	3
CO3	develop programs using web drivers	3	3	3	3	3	3
CO4	design test cases for validation of data	3	2	2	3	3	3
CO5	plan automation to address real time problems	3	3	3	3	3	3

SUMMER INTERNSHIP

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PR-311	-	-	-	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

CODING SKILLS MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-MC-301	1	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO12
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CO1	solve real world problems using C & DS	3	3	3	3	3
CO2	solve real world problems using DBMS	3	3	3	3	3
CO3	solve real world problems using Python	3	3	3	3	3
CO4	solve real world problems using Java, HTML, JavaScript	3	3	3	3	3
CO5	solve real world problems using any one emerging technology	3	3	3	3	3

IOT WITH CLOUD COMPUTING

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PSO1
CO1	explain the concepts of IoT	3	2	3	3	3	3
CO2	illustrate the foundations of IoT	3	2	3	3	3	3
CO3	adapt protocol and standards of IoT	3	3	3	3	3	3
CO4	outline the importance of cloud in IoT	3	3	3	3	3	3
CO5	make use of cloud in IoT enabled spaces	3	2	3	3	3	3

MACHINE LEARNING AND DATA SCIENCE

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	demonstrate the required mathematical foundations for ML& DS	3	3	3	3	3
CO2	outline the functionalities of machine learning	3	3	3	3	3
CO3	illustrate learning algorithms & data science basics	3	3	2	2	3
CO4	build data science applications using Python based toolkits	3	3	3	3	3
CO5	use recommender systems and sentiment analysis in real time applications	3	3	3	3	3

FULL STACK WEB DEVELOPMENT

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	explain the concepts of full stack web development	3	2	2	3	3
CO2	illustrate High level programming and jQuery concepts	3	2	2	3	3
CO3	make use of Node.js and MongoDB Driver for web development	3	3	3	3	3
CO4	develop app using angularJS concepts	3	3	3	3	3
CO5	establish version control in GitHub	3	2	3	3	3



COMPUTER VISION (Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PE-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of geometric camera models	3	2	2	3	2	3
CO2	demonstrate light and shading	3	3	3	3	3	3
CO3	illustrate the concepts of colour in computer vision	3	3	2	3	2	3
CO4	make use of linear filters	3	3	2	3	2	3
CO5	adapt local image features	3	2	2	3	2	3

BLOCKCHAIN AND CRYPTOCURRENCY (Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PE-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the fundamentals of Blockchain techniques	3	2	2	3	3	3
CO2	analyze various consensus problems	3	3	3	3	2	3
CO3	adapt Blockchain technology to improve business	3	3	3	3	2	3
CO4	make use of Ethereum frameworks to write smart contract	3	3	3	3	2	3
CO5	interpret Blockchain technology in real time applications	3	3	3	3	2	3

AUGMENTED AND VIRTUAL REALITY (Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PE-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	illustrate taxonomy and features of AR systems	2	2	2	2	2	3
CO2	explain fundamentals of virtual reality	3	3	3	3	3	3
CO3	adapt geometric modeling in virtual reality environment	3	3	3	3	3	3
CO4	make use of virtual environment for animation	3	2	3	3	2	3
CO5	develop VR and AR applications	3	3	3	3	3	3

DISASTER MANAGEMENT (Open Elective - I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3



CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

ROBOTICS (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2
CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate sensors for robot	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

JAVA PROGRAMMING (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-324	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	create packages and interfaces	3	2	3	3	2
CO4	build efficient code using multithreading and exception handling	3	2	3	3	2
CO5	design real-time applications using applets	3	2	3	3	2



IOT WITH CLOUD COMPUTING LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-324	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	identify various IoT devices	3	3	3
CO2	use IoT devices in various applications	3	3	3
CO3	develop automation work-flow in IoT enabled cloud environment	3	3	3
CO4	take part in practicing and monitoring remotely	3	3	3
CO5	make use of various IoT protocols in cloud	3	3	3

MACHINE LEARNING AND DATA SCIENCE LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-325	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	illustrate the implementation procedures for the ML algorithms	3	3	3
CO2	demonstrate the ID3 classification algorithms	3	3	3
CO3	analyze k-Means clustering on different datasets	3	3	3
CO4	apply predictive algorithms on live data	3	3	3
CO5	identify the regression algorithms to solve real world problems	3	3	3

FULL STACK WEB DEVELOPMENT LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-326	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	illustrate implementation procedure of full stack web development	3	3	3
CO2	demonstrate HTML5, CSS5 scripting languages and Github	3	3	3
CO3	make use of scripting languages in web development	3	3	3
CO4	develop web applications using AJAX	3	3	3
CO5	build real time applications using full stack web development	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-HSMC-301	1	-	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3



HUMAN VALUES AND PROFESSIONAL ETHICS MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-MC-302	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO12
CO1	identify values and ethics and its relation to individual excellence	3	3	3	2
CO2	outline the ten commandments and try to apply in professional career	2	2	3	2
CO3	illustrate modern percepts of ethics, CSR and Corporate Governance	3	3	3	2
CO4	analyze the purpose of professional code of ethics and whistle blowing	3	3	3	2
CO5	practice student professional/technical societies/associations activities	3	3	3	3

BUSINESS ECONOMICS

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-HSMC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	outline the concepts of business management & economics	3	2
CO2	identify demand function to predict sales using linear regression	3	2
CO3	adapt production, price, market and cost analysis functions	3	2
CO4	estimate enterprise requirements under risky economic environment	2	3
CO5	assess the operational and financial performance of an enterprise	3	3

GO PROGRAMMING

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	illustrate the concepts of Go programming	2	3	2	3	3
CO2	demonstrate the variables of Go programming	2	2	2	3	3
CO3	outline functions and packages of Go programming	3	3	3	2	2
CO4	interpret servers of Go programming	3	3	3	3	3
CO5	make use of servers and concurrency in Go programming	3	3	3	2	3

NATURAL LANGUAGE PROCESSING (Professional Elective - III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PE-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain fundamentals of NLP and morphology	3	2	3	3	3	3
CO2	demonstrate word level statements and syntactic analysis	3	2	3	3	3	3
CO3	make use of context free grammar and parsing techniques	3	3	3	3	3	3
CO4	apply semantic analysis techniques to solve various problems	3	3	3	3	3	3

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CO5	illustrate language generation and discourse analysis	3	2	3	3	3	3
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ROBOTIC PROCESS AUTOMATION (Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PE-412	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline the basics of RPA	3	3	2	3	3	3
CO2	implement RPA	3	3	3	3	3	3
CO3	demonstrate RPA tools and automation techniques	2	2	2	3	3	3
CO4	adapt RPA BOT Models	3	3	3	3	3	3
CO5	execute Orchestrator	3	3	3	3	3	3

COMPUTER FORENSICS (Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PE-413	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of computer forensics	3	2	2	3	3	3
CO2	illustrate the methods for evidence collection and data seizure	3	3	3	3	3	3
CO3	analyze and validate digital forensic evidences	3	3	3	3	3	3
CO4	solve the computer fraud cases using forensics tools	3	3	3	3	3	3
CO5	make use of various operating systems for computer forensics	3	3	3	3	3	3

NEURAL NETWORKS AND DEEP LEARNING (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PE-414	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	illustrate the functionalities of neural networks	3	3	2	3	3	3
CO2	analyze the single-layer and multi-layer perceptrons	3	3	3	3	3	3
CO3	interpret deep feed forward networks with regularization	3	3	3	3	3	3
CO4	demonstrate convolutional neural networks in deep learning	3	3	3	3	3	3
CO5	outline the importance of autoencoders	3	2	2	3	3	3

QUANTUM COMPUTING (Professional Elective – IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PE-415	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
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CO1	explain the concepts of quantum computing	3	2	2	2	2	3
CO2	use mathematical foundations for quantum computing	3	3	3	2	2	3
CO3	outline the architecture and programming models	3	2	2	2	3	3
CO4	utilize basic techniques of quantum computing	3	3	3	3	2	3
CO5	elaborate major algorithms and discuss about OSS toolkits	3	3	3	3	3	3

SOFTWARE PROCESS & PROJECT MANAGEMENT (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PE-416	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain the concepts of Software process improvement	3	3	2	3	3	3
CO2	illustrate assessment phases and principles	3	3	3	3	3	3
CO3	adapt and establish software configuration management	2	2	2	3	3	3
CO4	use lifecycle phases in project maintenance	3	3	3	3	3	3
CO5	establish iterative process planning & automation	3	3	3	3	3	3

GREEN BUILDING TECHNOLOGIES (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO7	PO12
CO1	explain the fundamentals of energy use and processes in building	3	2	2	2
CO2	identify indoor environmental requirement and its management	3	3	3	2
CO3	assess the impact of solar radiation on buildings	3	3	3	2
CO4	evaluate end-use energy utilization and requirements	3	3	2	2
CO5	adapt audit procedures for energy management	3	3	3	2

DRONES (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-412	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO7	PO12
CO1	explain concepts of creative industries	3	3	3	3	3	3
CO2	outline the needs of creative industries	3	3	3	3	3	3
CO3	illustrate deployment and deadly abilities of drones	3	3	3	3	3	3
CO4	adapt price based data routing in dynamic IoT	3	3	3	3	3	3
CO5	make use of security in UAV/Drone communications	3	3	3	3	3	3



5G TECHNOLOGIES (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-413	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain basic principles of 5G communication	3	3	2	2	3	3	3
CO2	identify the 5G new radio, core network, mobile networks	3	3	2	2	3	3	3
CO3	analyze the physical architecture of 5G and its challenges	3	3	2	2	3	3	3
CO4	design the modulation and multiple access technique for 5G	3	3	2	2	3	3	3
CO5	evaluate the various channels, layers and links used in 5G	3	3	2	2	3	3	3

DATABASE MANAGEMENT SYSTEMS (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-414	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2

GO PROGRAMMING LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PC-412	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	write simple programs using Go programming concepts	3	3	3
CO2	articulate the variables of Go programming	3	3	3
CO3	make use of functions and packages of Go programming	3	3	3
CO4	pivot servers of Go programming	3	3	3
CO5	prioritize servers and concurrency in Go programming	3	3	3

INDUSTRY ORIENTED MINI-PROJECT

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PR-411	-	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3



CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3

GENETIC ALGORITHMS AND APPLICATIONS (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CS-PE-421	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the concepts of genetic algorithms	3	2	2	2	3	3
CO2	illustrate solution spaces in genetic algorithms	3	3	3	2	3	3
CO3	adapt advanced concepts of genetic algorithms	3	3	3	3	3	3
CO4	use genetic programming in real-time applications	3	2	2	3	3	3
CO5	demonstrate particle swarm and ant colony optimization	3	2	2	3	3	3

ADVANCED ALGORITHMS (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CS-PE-422	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PSO1
CO1	outline various analysis techniques for algorithms	3	3	2	2	3
CO2	develop applications using graph algorithms	2	3	3	3	3
CO3	analyze network sorting and matrix operations	3	3	3	3	3
CO4	illustrate various string-matching algorithms	3	3	3	3	3
CO5	solve problems using NP-Completeness & Approximate algorithms	2	3	3	2	3

NATURE INSPIRED COMPUTING (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CS-PE-423	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of Nature Inspired Computing	3	3	2	2	3	3
CO2	develop programs using the concepts of Genetic Algorithms	3	3	3	2	3	3
CO3	make use of Swarm Intelligence and immunocomputing	3	3	3	3	3	3
CO4	show self-tuning algorithms	3	2	3	3	3	3
CO5	describe nature inspired computing for artificial life	3	2	2	2	3	3



COGNITIVE COMPUTING (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CS-PE-424	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of cognitive computing	3	3	3	3	3	3
CO2	illustrate complex relationship between systems	3	3	3	3	3	3
CO3	describe the hypothesis and design principle of cognitive system	3	3	3	3	3	3
CO4	show the business implications of cognitive computing	3	3	3	3	3	3
CO5	articulate future applications of cognitive computing	3	2	2	3	3	3

INFORMATION STORAGE AND RETRIEVAL (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CS-PE-425	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline the importance of Information storage and Retrieval	3	3	3	3	3	3
CO2	illustrate cataloging and indexing in information storage	3	2	3	3	3	3
CO3	adapt automatic indexing and clustering in information storage	3	3	3	3	3	3
CO4	implement user search techniques	3	3	3	3	3	3
CO5	apply text search algorithm in information retrieval	3	2	2	3	3	3

AD-HOC AND SENSOR NETWORKS (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CS-PE-426	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the concepts of Ad-hoc and sensor networks	3	3	2	2	2	3
CO2	apply QoS for secure MANETs	3	3	3	3	3	3
CO3	illustrate load distribution and routing protocol in MANETs	3	3	3	3	2	3
CO4	utilize power management & time synchronization techniques	3	3	3	3	3	3
CO5	adapt Wi-Fi for Ad-hoc networks	3	3	2	2	3	3

INTELLECTUAL PROPERTY RIGHTS (Open Elective-III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-421	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO8	PO12
CO1	outline basics of intellectual property law	3	3	3	3
CO2	identify the various trademarks	3	3	3	3

(Signature)

CO3	analyze patent and copy rights law	3	3	3	3
CO4	differentiate trade secret and unfair practice	3	2	3	2
CO5	summarize new developments in Intellectual Property Rights	3	3	3	3

PRINCIPLES OF ENTREPRENEURSHIP (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-422	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3

PRECISION AGRICULTURE (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-423	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO2
CO1	explain the concepts of precision agriculture	3	3	3	3	3	3
CO2	outline the components of precision agriculture	3	3	3	3	3	3
CO3	illustrate about tools technologies and sampling	3	3	3	3	3	3
CO4	adapt recent advances in precision agriculture	3	3	3	3	3	3
CO5	make use of feasibility and evaluation of precision farming	3	3	3	3	3	3

WEB TECHNOLOGIES (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-424	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2



MAIN PROJECT

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CS-PR-421	-	-	20	10

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (R22)
MATRICES AND CALCULUS

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22BS11	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	verify mean value theorems and evaluate improper integrals	3	2	1
CO4	find the extreme values of functions of several variables	3	2	1
CO5	evaluate multiple integrals and apply them to find areas and volumes	3	2	1

ENGINEERING CHEMISTRY

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22BS14	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1
CO4	illustrate the various fuels, synthesis of polymers	3	2	1
CO5	analyze and understand the properties, applications of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22ES11	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	elaborate the concepts of network theorems & single phase AC circuits	3	3	2	1
CO3	explain three phase AC circuits and P-N Junction Diode	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1

PROGRAMMING FOR PROBLEM SOLVING

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22ES12	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2



CO4	construct programs for heterogeneous data and file handling	3	3	2	2
CO5	implement various searching and sorting techniques in C programming	3	3	2	2

ELEMENTS OF COMPUTER SCIENCE & ENGINEERING

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22ES13	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PO9	PO12
CO1	explain the functions of a basic computer and PL	3	3	3	3	3	3	3
CO2	describe the need of OS, database systems and SE	3	3	3	3	3	3	3
CO3	illustrate networks, internet, WWW and security	3	3	3	3	3	3	3
CO4	outline the concepts of AI & ML	3	3	3	3	3	3	3
CO5	demonstrate concepts of DS and autonomous systems	3	3	3	3	3	3	3

ENGINEERING CHEMISTRY LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22BS15	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO9
CO1	determine the hardness in water samples to solve societal problems	3	3
CO2	estimate the strength of the given solutions	3	3
CO3	determine surface tension, Acid value and viscosity of various fluids	3	3
CO4	analyze the rate of corrosion of mild steel in various conditions	3	3
CO5	verify and understand the distribution coefficient	3	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22ES15	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO9
CO1	design electrical circuits to verify circuit laws	3	3
CO2	evaluate network theorems	3	3
CO3	verify the V-I characteristics of various electronic devices	3	3
CO4	determine the efficiency of various rectifiers	3	3
CO5	illustrate the configurations of Bi-polar junction transistor	3	3

PROGRAMMING FOR PROBLEM SOLVING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22ES16	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
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CO1	execute simple programs using C compiler	3	3	3
CO2	apply control statements in designing programs	3	3	3
CO3	design programs using functions, arrays, strings and pointers	3	3	3
CO4	construct programs for heterogeneous data and file operations	3	3	3
CO5	implement various searching and sorting techniques in C programming	3	3	3

COMPUTER AIDED ENGINEERING GRAPHICS LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22ES17	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	3	3
CO2	construct conic sections using various methods	3	3	3	3
CO3	draw orthographic projections of points, lines, planes and solids	3	3	3	3
CO4	draw development of solid surfaces	3	3	3	3
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	3	3

ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22BS21	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	identify whether the given differential equation of first order is exact or not	3	2	1
CO2	solve ordinary differential equations of higher order	3	2	1
CO3	use the Laplace transforms techniques for solving ODE's	3	2	1
CO4	find vector differentiation of vector & scalar field/gradient/divergence/curl	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

APPLIED PHYSICS

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22BS22	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the principles of Quantum Physics and band theory of solids	3	2	1
CO2	classify semiconductors and relate functioning of semiconductor devices	3	2	1
CO3	outline the concepts of dielectric, magnetic and energy materials	3	2	1
CO4	use fabrication and characterization techniques of nano-materials	3	2	1
CO5	illustrate principles and applications of lasers and optical fibers	3	2	1



ENGLISH FOR SKILL ENHANCEMENT

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22HS21	2	-	-	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in LSRW skills	3	2
CO2	demonstrate the acquired language in written and spoken contexts	3	2
CO3	express, restate and respond appropriately by comprehending the given data	3	2
CO4	develop proficiency to succeed in academic activities, research and career	3	2
CO5	excel in professional and social etiquette	3	2

DATA STRUCTURES THROUGH PYTHON

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22ES22	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the fundamentals of python programming	3	3	2	2
CO2	develop programs using collections, classes and build error-free codes	3	3	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	make use of various concepts of non-linear data structures	3	3	3	2
CO5	design data structures using graphs	3	3	3	3

APPLIED PHYSICS LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22BS23	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO9
CO1	calculate the Planck's constant, Hall co-efficient and Energy gap of semiconductors	3	3
CO2	examine the working of semiconductor and optoelectronic devices	3	3
CO3	demonstrate the behavior of magnetic and dielectric materials	3	3
CO4	demonstrate the properties of laser and optical fiber	3	3
CO5	compare practical results with theoretical calculations in electrical circuits	3	3

ENGLISH LANGUAGE LABORATORY FOR EFFECTIVE COMMUNICATION

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22HS22	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO9	PO10
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CO1	identify the nuances of the language through multimedia experience	3	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3	3
CO4	develop speaking and listening skills	3	3	3
CO5	appraise communication and correspond effectively	3	3	3

DATA STRUCTURES THROUGH PYTHON LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22ES24	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	write simple programs using python	3	3	3
CO2	develop programs using collections and classes	3	3	3
CO3	construct different linear data structures along with their operations	3	3	3
CO4	implement various search trees	3	3	3
CO5	design programs for traversing graphs	3	3	3

IT WORKSHOP PRACTICE

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22ES26	-	1	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	classify hardware components and inter dependencies	3	3	2	2
CO2	install operating systems and MS office	3	3	2	2
CO3	configure IP and trouble shoot network connections	3	3	3	2
CO4	use internet and safeguard computer systems from viruses/worms	3	3	3	2
CO5	prepare documentation/presentation by using office tools	3	3	3	2

DESIGN THINKING FOR INNOVATION AND STARTUPS

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22ES27	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO12	PSO1	PSO2
CO1	illustrate the design thinking practices for value based innovation	3	3	3
CO2	analyze stakeholder behaviour and empathy in ideation	3	3	3
CO3	develop and test prototype for its scalability	3	3	3
CO4	identify and standardize business process	3	3	3
CO5	prepare a startup pitch	3	3	3

ENVIRONMENTAL SCIENCE & DISASTER MANAGEMENT MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22MC21	2	-	-	-



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	explain the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	identify solutions for sustainable development and pollution control	3	3	3	2
CO4	analyze various types of disasters	3	3	3	3
CO5	develop strategies for preparedness measures against disasters	3	3	3	2

STATISTICAL FOUNDATIONS FOR COMPUTER SCIENCE

Course	B.Tech.-III-Sem.	L	T	P	C
Course Code	22BS31	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the concepts of probability and random variables	3	2	1
CO2	illustrate the importance of discrete, continuous and sampling distributions	3	2	1
CO3	use various estimation methods and test hypothesis for large samples	3	2	1
CO4	test hypothesis for small samples and find correlation/regression analysis	3	2	1
CO5	apply the theory of stochastic processes to analyze classification of states	3	2	1

DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION

Course	B.Tech.-III-Sem.	L	T	P	C
Course Code	22ES32	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12
CO1	interpret number systems and logical functions using K-Maps	3	3	2	2	2
CO2	design various combinational and sequential circuits	3	3	2	2	3
CO3	illustrate computer components and function of 8086 processor	3	3	2	2	2
CO4	analyze arithmetic operations and I/O operations	3	3	2	2	3
CO5	distinguish various memories and pipelining operations	3	3	2	2	3

SOFTWARE DESIGN AND ENGINEERING

Course	B.Tech.-III-Sem.	L	T	P	C
Course Code	22CSPC31	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO11	PO12	PSO1
CO1	identify & analyze software requirements and prepare SRS	3	3	3	3	3	3
CO2	design a system, component or process to meet the needs	3	3	3	3	3	3
CO3	make use of UML diagrams in software design	3	3	3	3	3	3
CO4	analyze various testing techniques by using various metrics	3	3	3	3	3	3
CO5	adapt risk management strategies to assure software quality	3	2	3	3	3	3



OOP THROUGH JAVA

Course	B.Tech.-III-Sem.	L	T	P	C
Course Code	22CSPC32	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple java programs using OOP concepts	3	3	2	2
CO2	interpret programs using OOP concepts	3	3	2	2
CO3	build efficient codes using multithreading and exception handling	3	3	3	3
CO4	design GUI programs using AWT and event handling	3	3	3	2
CO5	develop real-time applications using applets and swings	3	3	3	3

DATABASE MANAGEMENT SYSTEMS

Course	B.Tech.-III-Sem.	L	T	P	C
Course Code	22CSPC33	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design simple databases using database architectures	3	3	3	2
CO2	construct databases using ER Modelling	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	2
CO4	apply normalization on database to eliminate redundancy	3	3	3	2
CO5	explain transaction processing and concurrency control	3	3	3	2

OOP THROUGH JAVA LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Course Code	22CSPC34	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	write, compile and execute simple java programs	3	3	3
CO2	develop programs using inheritance, polymorphism, packages and Interfaces	3	3	3
CO3	demonstrate multithreading and exception handling mechanisms	3	3	3
CO4	design GUI using the concepts of AWT and event handling	3	3	3
CO5	build real-time applications using applets and swings	3	3	3

DATABASE MANAGEMENT SYSTEMS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Course Code	22CSPC35	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	construct databases using SQL commands	3	3	3
CO2	apply normalization techniques to eliminate redundancy	3	3	3
CO3	design a database schema for a given domain	3	3	3

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CO4	solve queries based on joins, nested queries and aggregate functions	3	3	3
CO5	execute PL/SQL programs for a given application	3	3	3

DATA WRANGLING AND VISUALIZATION – PYTHON/ R PROGRAMMING/POWER BI

Course	B.Tech.-III-Sem.	L	T	P	C
Course Code	22CSPC36	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO9	PO12	PSO2
CO1	create python shell script for data validation	3	3	3	3	3	3
CO2	demonstrate how to import data into tableau	3	3	3	3	3	3
CO3	apply the tableau concepts of dimensions and measures	3	3	3	3	3	3
CO4	develop programs, map visual layouts and graphical properties	3	3	3	3	3	3
CO5	create a dashboard that links multiple visualizations	3	3	3	3	3	3

APP DEVELOPMENT - ANDROID/FLUTTER/FLASK

Course	B.Tech.-III-Sem.	L	T	P	C
Course Code	22CSPC37	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO9	PO12	PSO2
CO1	demonstrate android/flutter/flask installation	3	3	3	3	3	3
CO2	develop various applications using android	3	3	3	3	3	3
CO3	design various applications using flutter	3	3	3	3	3	3
CO4	implement various applications using flask	3	3	3	3	3	3
CO5	solve real-world problems using android/flutter/flask	3	3	3	3	3	3

GENDER SENSITIZATION (MANDATORY COURSE - NON-CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Course Code	22MC31	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

EMPLOYABILITY SKILLS – I MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Course Code	22MC32	-	-	3	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3
CO3	build proficiency in quantitative reasoning	3	3
CO4	improve critical thinking skills	3	3
CO5	exhibit confidence in facing the interview process	3	3

DISCRETE MATHEMATICS & GRAPH THEORY

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22ES41	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	verify logical statements using connectives	3	3	2
CO2	validate arguments using predicate calculus	3	3	2
CO3	perform various operations with relational algebra	3	3	2
CO4	solve problems using combinatorics	3	3	2
CO5	simplify real-life situations using graph theory	3	3	3

DESIGN AND ANALYSIS OF ALGORITHMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22CSPC41	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	measure time and space complexity of algorithms	3	3	3	3
CO2	solve problems using disjoint sets and divide-and-conquer techniques	3	3	2	2
CO3	apply greedy method and dynamic programming paradigm to solve the problems	3	3	2	2
CO4	adapt back-tracking and branch-bound methods to solve problems	3	3	2	2
CO5	interpret NP-hard and NP-complete problems	3	3	2	2

COMPUTER NETWORKS

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22CSPC42	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	outline the basics of computer networks and various layers	3	3	2	3
CO2	demonstrate multiple access protocols	3	3	2	3
CO3	interpret network layer and routing algorithms	3	3	3	3
CO4	illustrate internetworking and various transport protocols	3	3	3	3
CO5	make use of various protocols of application layer	3	3	2	3



OPERATING SYSTEMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22CSPC43	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	outline various concepts operating systems and Linux utilities	3	3	2
CO2	solve synchronization problems by using process management and APIs	3	3	2
CO3	adapt various deadlock handling and memory management mechanism	3	3	2
CO4	analyze various file management system	3	3	2
CO5	make use of I/O Management and security mechanisms	3	3	2

FULL STACK DEVELOPMENT

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22CSPC44	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	explain the concepts of HTML5 and version control	3	2	2	3	3
CO2	illustrate java script and jQuery concepts	3	2	2	3	3
CO3	use Node.js and MongoDB Driver for web development	3	3	3	3	3
CO4	develop app using Angular concepts	3	3	3	3	3
CO5	design app using ReactJS concepts	3	2	3	3	3

CN & OS (LINUX) LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22CSPC45	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO5	PO9	PSO2
CO1	implement datalink protocols	3	3	3	3
CO2	find shortest path using routing table	3	3	3	3
CO3	illustrate Linux shell environment	3	3	3	3
CO4	interpret CPU scheduling algorithms and file allocation methods	3	3	3	3
CO5	experiment with page replacement and memory management	3	3	3	3

NODE JS/ANGULAR/REACT JS/DJANGO

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22CSPC46	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PO12	PSO2
CO1	build website with HTML5, CSS, Bootstrap and JavaScript	3	3	3	3	3
CO2	demonstrate JavaScript using NodeJS and MongoDB	3	3	3	3	3
CO3	develop single page application using Angular	3	3	3	3	3
CO4	develop single page application using React JS	3	3	3	3	3



CO5	design web application using Django	3	3	3	3	3
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AUTOMATED TESTING TOOLS - SELENIUM

Course	B.Tech.- IV-Sem.	L	T	P	C
Course Code	22CSPC47	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO8	PO9	PO12	PSO2
CO1	install JAVA, Associate SWD Jars and Browser drivers	3	3	3	3	3	3	3
CO2	devise website issues using automation	3	3	3	3	3	3	3
CO3	develop programs using web drivers	3	3	3	3	3	3	3
CO4	design test cases for validation of data	3	3	3	3	3	3	3
CO5	plan automation to address real time problems	3	3	3	3	3	3	3

REAL TIME/SOCIETAL RESEARCH PROJECT

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22CSPR41	-	-	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify relevant problem and design & develop a prototype	3
CO2	execute project using modern tools and prepare the report	3
CO3	exhibit leadership and managerial skills in project development	3
CO4	function effectively as individual, member and/or leader in project teams	3
CO5	apply engineering knowledge for societal sustenance	3

INDIAN CULTURE AND CONSTITUTION MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22MC41	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	1
CO2	explain features of languages, religions and holy books	3	2
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	2

EMPLOYABILITY SKILLS – II MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22MC42	-	-	3	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO9	PO10
CO1	make use of soft skills to become a professional team member	3	3
CO2	develop professional correspondence skills	3	3
CO3	apply knowledge of decision making, leadership, motivation	3	3
CO4	adapt principles of quantitative aptitude to achieve qualitative results	3	3
CO5	exhibit confidence in facing the interview process	3	3

AUTOMATA AND COMPILER DESIGN

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CSPC51	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design various finite automata	3	3	3	2
CO2	write a context free grammar for a given language	3	3	3	2
CO3	construct various parsers, semantics and intermediate code forms	3	3	3	2
CO4	implement code optimization techniques	3	3	3	2
CO5	apply generic code generation algorithm to generate target code	3	3	3	2

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CSPC52	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12	PSO1
CO1	illustrate the concepts of AI and various search algorithms	3	3	3	3	3	3
CO2	adapt knowledge representation and probabilistic reasoning	3	3	3	3	2	3
CO3	explain expert systems and concepts of machine learning	3	3	2	3	3	3
CO4	classify various supervised learning algorithms	3	3	2	3	2	3
CO5	demonstrate the various unsupervised learning algorithms	3	3	2	3	3	3

DATA MINING AND DATA ANALYTICS

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CSPC53	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	summarize fundamentals of data mining	3	2	3	3	2
CO2	illustrate various mining association rules	3	3	2	2	3
CO3	make use of classification and clustering techniques	3	3	3	2	3
CO4	outline various data analytics techniques	3	2	2	2	3
CO5	solve statistical problems using R programming	3	3	3	3	3



INFORMATION AND CYBER SECURITY

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CSPC54	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain information and cyber security terminologies	2	2	2	3	2	3
CO2	apply cryptography for security networks	3	3	3	3	3	3
CO3	identify various cyber offences	3	3	3	3	3	3
CO4	use standards and cyber laws to enhance cyber security	3	3	3	3	3	3
CO5	illustrate the importance of security policies & IT Act	3	3	3	3	3	3

DIGITAL MARKETING (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CSPE51	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	outline the importance of digital marketing	2	1	2	3	3	3
CO2	use search engine optimization to achieve business goals	3	2	3	3	3	3
CO3	adapt social media for business promotion	3	3	3	3	3	3
CO4	identify and register a domain	3	2	3	3	3	3
CO5	apply digital marketing techniques in real time applications	3	3	3	3	3	3

SOFT COMPUTING (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CSPE52	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	use search techniques in AI problems	3	2	2	2	2	3
CO2	describe various supervised learning techniques	3	2	3	3	2	3
CO3	apply special networks in soft computing problems	3	3	3	3	3	3
CO4	implement fuzzy systems in engineering applications	3	2	3	3	3	3
CO5	perform various operations of genetic algorithms	3	3	3	3	3	3

MIDDLEWARE TECHNOLOGIES (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CSPE53	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the basic concepts of middleware elements	3	3	3	2	2	2
CO2	develop XML for a data source based website	3	3	3	3	3	2
CO3	make use of ASP.NET to implement database access	3	3	3	3	3	2
CO4	organize application and session states	3	3	3	3	2	2
CO5	demonstrate web services	3	3	3	3	3	2

IMAGE PROCESSING (Professional Elective - I)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CSPE54	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of image	3	2	2	2	3	3
CO2	illustrate image enhancement techniques	3	3	3	2	3	3
CO3	adapt image restoration to refine an image	3	3	3	3	3	3
CO4	use image processing color enhancement	3	2	2	3	3	3
CO5	demonstrate image segmentation & compression	3	2	2	3	3	3

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CSPC55	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	illustrate various search techniques	3	3	3	3
CO2	solve real-time problems using graph theory	3	3	3	3
CO3	use techniques of knowledge representation and probabilistic reasoning	3	3	3	3
CO4	design various supervised learning algorithms	3	3	3	3
CO5	implement various unsupervised learning algorithms	3	3	3	3

DATA MINING AND DATA ANALYTICS LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CSPC56	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	make use of open source data mining and analytic tools	3	3	3	3
CO2	examine the interesting insights of Apriori algorithm using WEKA	3	3	3	3
CO3	demonstrate the classification and clustering techniques	3	3	3	3
CO4	analyze the concepts of data analytics and statistical testing methods	3	3	3	3
CO5	compare various kinds of regression techniques	3	3	3	3

INFORMATION AND CYBER SECURITY LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CSPC57	-	-	2	1



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	explain concepts of cryptanalysis	3	3	3	3
CO2	Examine different vulnerability attacks	3	3	3	3
CO3	illustrate Wi-Fi security techniques	3	3	3	3
CO4	Able to do malware analysis.	3	3	3	3
CO5	Able to configure simple firewall and IT audit	3	3	3	3

AUTOMATED WRITING TOOLS - ChatGPT

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CSPC58	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO8	PO9	PO12	PSO2
CO1	develop content using ChatGPT	3	3	3	3	3	3	3
CO2	plan data simulation using ChatGPT	3	3	3	3	3	3	3
CO3	sketch images using ChatGPT	3	3	3	3	3	3	3
CO4	take a part in validation of data using ChatGPT	3	3	3	3	3	3	3
CO5	modify research content using ChatGPT	3	3	3	3	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22HS51	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO9	PO10
CO1	assess and utilize vocabulary in an effective way	3	3	3
CO2	interpret interpersonal relationships	3	3	3
CO3	elaborate academic reading and writing skills	3	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3	3

ENVIRONMENTAL SCIENCE & DISASTER MANAGEMENT MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22MC51*	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	explain the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	identify solutions for sustainable development and pollution control	3	3	3	2
CO4	analyze various types of disasters	3	3	3	3
CO5	develop strategies for preparedness measures against disasters	3	3	3	2



IOT AND CLOUD COMPUTING

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22CSPC61	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PSO1
CO1	explain the concepts of IoT	3	2	3	3	3	3
CO2	illustrate the foundations of IoT	3	2	3	3	3	3
CO3	adapt protocol and standards of IoT	3	3	3	3	3	3
CO4	outline the importance of cloud in IoT	3	3	3	3	3	3
CO5	make use of cloud in IoT enabled spaces	3	2	3	3	3	3

ROBOTIC PROCESS AUTOMATION

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22CSPC62	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	outline the basics of RPA	3	3	3	3	3
CO2	implement RPA	3	3	3	3	3
CO3	demonstrate RPA tools and automation techniques	2	2	3	3	3
CO4	adapt RPA BOT Models	3	3	3	3	3
CO5	execute Orchestrator	3	3	3	3	3

DEVOPS

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22CSPC63	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	summarize DevOps and continuous delivery concepts	3	3	3	3	3
CO2	explain DevOps architecture	3	3	3	3	3
CO3	articulate source code control in system building	3	2	3	3	3
CO4	take part in server building	3	3	3	3	3
CO5	plan automation and system testing	3	2	3	3	3

DATA SCIENCE AND BIG DATA ANALYTICS (Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CSPE61	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the basics of data science and big data analytics	3	3	3	3	3	3
CO2	illustrate exploratory data analysis	3	3	3	3	3	3
CO3	use advanced analytical theory and methods	3	3	3	2	2	3
CO4	sketch SQL commands for big data	3	3	3	3	3	3

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CO5	describe data visualization	3	3	3	3	3	3
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NATURAL LANGUAGE PROCESSING (Professional Elective -II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CSPE62	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain fundamentals of NLP and morphology	3	2	3	3	3	3
CO2	demonstrate word level statements and syntactic analysis	3	2	3	3	3	3
CO3	make use of context free grammar and parsing techniques	3	3	3	3	3	3
CO4	apply semantic analysis techniques to solve various problems	3	3	3	3	3	3
CO5	illustrate language generation and discourse analysis	3	2	3	3	3	3

ADVANCED MACHINE LEARNING (Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CSPE63	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	use Deep belief networks and CNN	3	3	2	2	3	3
CO2	classify autoencoders and CNN	3	3	3	2	2	3
CO3	illustrate semi-supervised learning and categorization	3	3	3	3	3	3
CO4	apply feature engineering	3	3	3	3	2	3
CO5	design application using ensemble methods	3	2	2	2	2	3

BLOCKCHAIN AND CRYPTOCURRENCY (Professional Elective -II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22CSPE64	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the fundamentals of Blockchain techniques	3	2	2	3	3	3
CO2	analyze various consensus problems	3	3	3	3	3	3
CO3	adapt Blockchain technology to improve business	3	3	3	3	3	3
CO4	make use of ethereum frameworks to write smart contract	3	3	3	3	3	3
CO5	interpret Blockchain technology in real time applications	3	3	3	3	3	3

E-COMMERCE (Open Elective - I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22OE61	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO3	PO8	PO9	PO10	PO12
CO1	outline the concepts of E-Commerce	3	2	2	3	3
CO2	develop supporting environment for E-Commerce	3	2	3	3	3
CO3	make use of technology in E-Commerce	3	3	3	3	3
CO4	adapt payment technologies in E-Commerce	3	3	3	3	3
CO5	implement security in E-Commerce	3	3	3	3	3

AGILE METHODOLOGIES (Open Elective - I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22OE62	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12
CO1	explain the concepts of agile methodology	3	2	3	3	3
CO2	make use of agile process	3	3	3	3	3
CO3	illustrate agility and knowledge management	3	3	3	3	3
CO4	adapt agility and requirements engineering	3	3	3	3	3
CO5	outline the importance agility and quality assurance	3	2	3	3	3

ELECTRONIC SENSORS (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22OE63	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO8	PO12
CO1	analyze the characterization of sensors	3	3	2	2	3	3
CO2	illustrate thermal embedded system	3	2	3	3	3	3
CO3	adapt magnetic sensors	3	3	3	2	3	3
CO4	make use of radiation sensors	3	3	3	2	3	3
CO5	design a system with sensors	3	2	3	2	3	3

IOT AND CLOUD COMPUTING LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22CSPC64	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	identify various IoT devices	3	3	3	3
CO2	use IoT devices in various applications	3	3	3	3
CO3	develop automation work-flow in IoT enabled cloud environment	3	3	3	3
CO4	take part in practicing and monitoring remotely	3	3	3	3
CO5	make use of various IoT protocols in cloud	3	3	3	3



ROBOTIC PROCESS AUTOMATION LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22CSPC65	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	install RPA packages	3	3	3	3
CO2	apply variables, data types, control statements in designing RPA	3	3	3	3
CO3	make use of data manipulation, recording and scrapping techniques	3	3	3	3
CO4	use selectors, data tables in excel for automation	3	3	3	3
CO5	develop email and PDF automation	3	3	3	3

DEVOPS LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22CSPC66	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	identify DevOps workflow	3	3	3	3
CO2	use eclipse for DevOps	3	3	3	3
CO3	develop docker image	3	3	3	3
CO4	take part in grid deployment	3	3	3	3
CO5	make use of Jenkins framework in DevOps	3	3	3	3

INDUSTRY ORIENTED MINI PROJECT/INTERNSHIP

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO1
CO1	apply domain knowledge to solve identified industrial problem	3
CO2	use industrial processes involved in end product/service	3
CO3	exhibit communication skills, professional ethics and social responsibility	3
CO4	manage and lead project in coordination with functional team-members	3
CO5	execute the project that meets industry requirements	3

SKILLS ENHANCEMENT COURSE - BIG DATA-SPARK

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22CSPR61	-	-	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO1
CO1	install Apache Spark	3
CO2	implement decision trees	3
CO3	execute support vector machine	3
CO4	weigh naïve Bayes' classifier	3
CO5	support Apache Spark	3



ENTREPRENEURSHIP AND IPR MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22MC61	3	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO7	PO8	PO12
CO1	illustrate entrepreneurship principles	3	3	3	3
CO2	analyze entrepreneurs' mindset	3	3	3	3
CO3	develop Business Plan and incubate innovative ideas	3	3	3	3
CO4	identify entrepreneurs' challenges in light of legal environment	3	2	3	2
CO5	demonstrate various types of IPRs applicable	3	3	3	3

MANAGEMENT, ECONOMICS AND ACCOUNTANCY

Course	B.Tech.-VII-Sem.	L	T	P	C
Course Code	22HS71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	apply principles of management in professional career	3	2
CO2	make use of principles of economics for decision making	3	2
CO3	solve problems in the areas of production, cost and price	3	2
CO4	prepare balance sheet and maintain books of accounts	2	3
CO5	analyze financial performance of an enterprise	3	3

GO PROGRAMMING

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CSPC71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	illustrate the concepts of Go programming	2	3	2	3	3
CO2	demonstrate the variables of Go programming	2	2	2	3	3
CO3	outline functions and packages of Go programming	3	3	3	2	2
CO4	interpret servers of Go programming	3	3	3	3	3
CO5	make use of servers and concurrency in Go programming	3	3	3	2	3

COMPUTER VISION AND ROBOTICS (Professional Elective -III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Course Code	22CSPE71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of geometric camera models	3	2	2	3	2	3



CO2	demonstrate light and shading	3	3	3	3	2	3
CO3	illustrate the concepts of colour in computer vision	3	3	2	3	2	3
CO4	make use of linear filters and kinematics	3	3	2	3	2	3
CO5	adapt Stereopsis and Robotics	3	2	2	3	2	3

INFORMATION STORAGE AND RETRIEVAL (Professional Elective - III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CSPE72	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline the importance of Information storage and Retrieval	3	3	3	3	3	3
CO2	illustrate cataloging and indexing in information storage	3	2	3	3	3	3
CO3	adapt automatic indexing and clustering in information storage	3	3	3	3	3	3
CO4	implement user search techniques	3	3	3	3	3	3
CO5	apply text search algorithm in information retrieval	3	2	2	3	3	3

HUMAN COMPUTER INTERACTION (Professional Elective - III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Course Code	22CSPE73	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of human behaviour and memories	3	3	2	3	3	3
CO2	illustrate VR and 3D interaction	3	3	3	3	3	3
CO3	adapt interaction design	2	2	2	3	3	3
CO4	use design focus in iteration and prototyping	3	3	3	3	3	3
CO5	establish HCI in software process	3	3	3	3	3	3

AD-HOC AND SENSOR NETWORKS (Professional Elective - III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Course Code	22CSPE74	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the concepts of Ad-hoc and sensor networks	3	3	2	2	2	3
CO2	apply QoS for secure MANETs	3	3	3	3	3	3
CO3	illustrate load distribution and routing protocol in MANETs	3	3	3	3	2	3
CO4	utilize power management & time synchronization techniques	3	3	3	3	3	3
CO5	adapt Wi-Fi for Ad-hoc networks	3	3	2	2	3	3

NEURAL NETWORKS AND DEEP LEARNING (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
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Course Code	22CSPE75	3	-	-	3
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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	illustrate the functionalities of neural networks	3	3	2	3	3	3
CO2	analyze the single-layer and multi-layer perceptrons	3	3	3	3	3	3
CO3	interpret deep feedforward networks with regularization	3	3	3	3	3	3
CO4	demonstrate convolutional neural networks in deep learning	3	3	3	3	3	3
CO5	outline the importance of autoencoders	3	2	2	3	3	3

**DATA OPTIMIZATION TECHNIQUES
(Professional Elective - IV)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CSPE76	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of optimization techniques	3	3	2	3	3	3
CO2	illustrate algorithms and complexity	3	3	2	3	3	3
CO3	demonstrate optimization techniques and algorithms	3	3	3	3	3	3
CO4	adapt optimization techniques approximation methods	3	3	3	3	3	3
CO5	make use of linear programming and evolutionary algorithms	3	3	3	3	3	3

**QUANTUM COMPUTING
(Professional Elective - IV)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Course Code	22CSPE77	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the concepts of quantum computing	3	2	2	2	2	3
CO2	use mathematical foundations for quantum computing	3	3	3	2	2	3
CO3	outline the architecture and programming models	3	2	2	2	3	3
CO4	utilize basic techniques of quantum computing	3	3	3	3	2	3
CO5	elaborate major algorithms and discuss about OSS toolkits	3	3	3	3	3	3

**SOFTWARE PROCESS & PROJECT MANAGEMENT
(Professional Elective - IV)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Course Code	22CSPE78	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain the concepts of Software process improvement	3	3	2	3	3	3



CO2	illustrate assessment phases and principles	3	3	3	3	3	3
CO3	adapt and establish software configuration management	2	2	2	3	3	3
CO4	use lifecycle phases in project maintenance	3	3	3	3	3	3
CO5	establish iterative process planning & automation	3	3	3	3	3	3

CHATBOTS (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Course Code	22OE71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO8	PO12
CO1	summarize chatbots and growth of internet	3	3	3	3	3	3
CO2	explain basics of bot building	3	3	3	3	3	3
CO3	articulate easy and hard ways of bot building	3	2	3	3	3	3
CO4	take part in deploying chatbot on apps	3	2	3	3	3	3
CO5	plan the deployment of chatbot	3	2	3	3	3	3

MULTIMEDIA AND ANIMATION (Open Elective – II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Course Code	22OE72	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	explain the concepts of multimedia	3	3	3	3	3	3
CO2	outline the concepts of animation	3	3	3	3	3	3
CO3	make use of 2D and 3D animation concepts	3	2	3	3	3	2
CO4	develop motion caption using animation techniques	3	2	3	3	3	2
CO5	build concept development using animation techniques	3	2	3	3	3	2

EMBEDDED SYSTEMS (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Course Code	22OE73	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO7	PO12
CO1	analyze the basic concepts of embedded systems	3	2	2	2	3	3
CO2	illustrate typical embedded system	3	2	3	3	3	3
CO3	adapt the knowledge of interfacing in embedded domain	3	3	3	2	3	3
CO4	compile embedded systems programming	3	3	3	2	3	3
CO5	explain the various real time operating system concepts	3	2	3	2	3	3



GO PROGRAMMING LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CSPC72	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	write simple programs using Go programming concepts	3	3	3	3
CO2	articulate the variables of Go programming	3	3	3	3
CO3	make use of functions and packages of Go programming	3	3	3	3
CO4	pivot servers of Go programming	3	3	3	3
CO5	prioritize servers and concurrency in Go programming	3	3	3	3

PROFESSIONAL PRACTICE, LAW & ETHICS LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Course Code	22HS71	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO10	PO12
CO1	identify code of ethics and professional responsibilities	3	3	3	3	3
CO2	illustrate law of contract and legality of object	3	3	3	3	3
CO3	outline salient features of sale of goods act and agency law	3	3	3	3	3
CO4	assess the process for arbitration, adjudication and conciliation	3	3	3	3	3
CO5	apply legal provisions for cyber & environmental protection laws	3	3	3	3	3

PROJECT STAGE - I

Course	B.Tech.-VII-Sem.	L	T	P	C
Course Code	22CSPR71	-	-	6	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the real-world complex problems and set of objectives	3
CO2	review relevant literature from various sources	3
CO3	compile data and propose suitable tools and techniques	3
CO4	prepare an abstract of the proposed project	3
CO5	apply core competence to propose economically feasible solutions	3

AUGMENTED AND VIRTUAL REALITY (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Course Code	22CSPE81	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	illustrate taxonomy and features of AR systems	2	2	2	2	2	3



CO2	explain fundamentals of virtual reality	3	3	3	3	3	3
CO3	adapt geometric modeling in virtual reality environment	3	3	3	3	3	3
CO4	make use of virtual environment for animation	3	2	3	3	2	3
CO5	develop VR and AR applications	3	3	3	3	3	3

ADVANCED ALGORITHMS (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Course Code	22CSPE82	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO12	PSO1
CO1	outline various analysis techniques for algorithms	3	3	2	2	3
CO2	develop applications using graph algorithms	2	3	3	3	3
CO3	analyze network sorting and matrix operations	3	3	3	3	3
CO4	illustrate various string-matching algorithms	3	3	3	3	3
CO5	solve problems using NP-Completeness & Approximate algorithms	2	3	3	2	3

NATURE INSPIRED COMPUTING (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Course Code	22CSPE83	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of Nature Inspired Computing	3	3	2	2	3	3
CO2	develop programs using the concepts of Genetic Algorithms	3	3	3	2	3	3
CO3	make use of Swarm Intelligence and immunocomputing	3	3	3	3	3	3
CO4	show self-tuning algorithms	3	2	3	3	3	3
CO5	describe nature inspired computing for artificial life	3	2	2	2	3	3

COMPUTER FORENSICS (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Course Code	22CSPE84	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of computer forensics	3	2	2	3	3	3
CO2	illustrate the methods for evidence collection and data seizure	3	3	3	3	3	3
CO3	analyze and validate digital forensic evidences	3	3	3	3	3	3
CO4	solve the computer fraud cases using forensics tools	3	3	3	3	3	3
CO5	make use of various operating systems for computer forensics	3	3	3	3	3	3



COGNITIVE COMPUTING (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Course Code	22CSPE85	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of cognitive computing	3	3	3	3	3	3
CO2	illustrate complex relationship between systems	3	3	3	3	3	3
CO3	describe the hypothesis and design principle of cognitive system	3	3	3	3	3	3
CO4	show the business implications of cognitive computing	3	3	3	3	3	3
CO5	articulate future applications of cognitive computing	3	2	2	3	3	3

DISTRIBUTED SYSTEMS (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Course Code	22CSPE86	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO12	PSO1
CO1	explain distributed systems models	3	3	3	3	3
CO2	evaluate distributed algorithms for clock synchronization	3	2	3	3	3
CO3	relate various inter process communication techniques	3	3	3	3	3
CO4	illustrate distributed file systems and name servers	3	3	3	3	3
CO5	demonstrate transactions and concurrency control	3	2	2	3	3

VEHICULAR AD-HOC NETWORKS (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Course Code	22CSPE87	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the concepts of the concepts of VANET	3	3	2	2	2	3
CO2	illustrate the efficiency of VANET applications	3	3	3	3	3	3
CO3	support Vehicular Mobility Modelling frameworks	3	3	3	3	2	3
CO4	demonstrate physical layer in VANET	3	3	3	3	3	3
CO5	examine security of a VANET	3	3	2	2	3	3

DRONES (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CSPE88	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
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CO1	explain concepts of creative industries	3	3	3	3	3	3
CO2	outline the needs of creative industries	3	3	3	3	3	3
CO3	illustrate deployment and deadly abilities of drones	3	2	2	3	3	3
CO4	adapt price based data routing in dynamic IoT	3	2	2	3	3	3
CO5	make use of security in UAV/Drone communications	3	2	2	3	3	3

GAME DEVELOPMENT (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22OE81	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO4	PO5	PO8	PO12
CO1	summarize game design concepts	3	3	2	3	2
CO2	explain basics of game & play	3	3	3	3	2
CO3	articulate game mechanics and experiences	3	3	3	3	3
CO4	take part in game structure development	3	3	3	3	3
CO5	plan aesthetics of game development	3	3	3	3	3

PRECISION AGRICULTURE (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22OE82	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO7	PO8	PO12
CO1	explain the concepts of precision agriculture	3	3	3	3	3
CO2	outline the components of precision agriculture	3	3	3	3	3
CO3	illustrate about tools technologies and sampling	3	3	3	3	3
CO4	adapt recent advances in precision agriculture	2	2	3	3	3
CO5	make use of feasibility and evaluation of precision farming	2	2	3	3	3

ELECTRONICS FOR HEALTH CARE (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22OE83	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO6	PO8	PO12
CO1	explain the various methods of recording of biopotentials	3	3	3	3	3
CO2	measure biochemical and various physiological information	2	3	2	3	3
CO3	make use of assist devices and biotelemetry	3	3	3	3	3
CO4	use of radiation for diagnostic and therapy	3	3	3	3	3
CO5	adapt techniques of electrical safety in hospitals	3	3	2	3	3



PROJECT STAGE – II INCLUDING SEMINAR

Course	B.Tech.-VIII-Sem.	L	T	P	C
Course Code	22CSPR81	-	-	22	11

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	design and develop a prototype/process/simulation for identified problem	3
CO2	execute project using modern tools and prepare the report	3
CO3	exhibit leadership and managerial skills in project development	3
CO4	function effectively as individual and member or leader in project teams	3
CO5	apply engineering knowledge for societal sustenance	3

Academic Regulations (R20)
B.Tech. - Regular Four Year Degree Programme (CSE – AI & ML)
(For batches admitted from the academic year 2020 - 21)
Department of Computer Science and Engineering (AI & ML)

LINEAR ALGEBRA & CALCULUS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-101	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	analyze the nature of sequences and series	3	2	1
CO4	verify mean value theorems and evaluate improper integrals by using Beta and Gamma functions	3	2	1
CO5	find the extreme values of functions of two variables	3	2	1

ENGINEERING CHEMISTRY

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-105	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1
CO4	illustrate the various fuels, synthesis of polymers and drugs	3	2	1
CO5	analyze the properties of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-101	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	elaborate the concepts of network theorems & single phase AC circuits	3	3	2	1
CO3	explain three phase AC circuits and P-N Junction Diode	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1

PROBLEM SOLVING WITH C PROGRAMMING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-103	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
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CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

ENGINEERING CHEMISTRY LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-106	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	determine the hardness in water samples to solve societal problems	3
CO2	estimate the strength of the given solutions	3
CO3	analyze adsorption and viscosity of various fluids	3
CO4	synthesize the various organic compounds used in medical industry	3
CO5	verify and understand the distribution coefficient	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-102	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws	3
CO2	evaluate network theorems	3
CO3	verify the V-I characteristics of various electronic devices	3
CO4	determine the efficiency of various rectifiers	3
CO5	illustrate the configurations of Bi-polar junction transistor	3

PROBLEM SOLVING WITH C PROGRAMMING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-104	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3
CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3

IT & ENGINEERING WORKSHOP PRACTICE

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-108	-	-	3	1.5



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	execute simple programs using Sci Lab	3	3	2	2
CO2	design programs using conditional statements and loops	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2

NATIONAL SERVICE SCHEME (NSS)/PHYSICAL EDUCATION/YOGA MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-MC-101	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO9	PO12
CO1	harness physical literacy and lifelong engagement	3	3	3	3	3
CO2	use aesthetic appreciation	2	1	2	3	3
CO3	build competence and confidence to face challenges	1	2	1	3	3
CO4	develop Sports related values and attitudes	3	3	2	2	3
CO5	follow appropriate etiquette and sports	1	1	2	3	3

ADVANCED CALCULUS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-102	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve linear and non-linear partial differential equations	3	2	1
CO3	evaluate the line, surface and volume integrals and convert them from one to another by using multiple integrals	3	2	1
CO4	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

APPLIED PHYSICS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-103	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the principles of Quantum Mechanics	3	2	1
CO2	analyze various electron theories of conduction in solids	3	2	1
CO3	classify semiconductors and relate functioning of semiconductor devices	3	2	1
CO4	illustrate principles and applications of lasers and optical fibers	3	2	1
CO5	outline dielectric and magnetic properties of materials	3	2	1

ENGLISH FOR ENGINEERS



Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-HSMC-101	2	-	-	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in RAWLS skills	3	1
CO2	demonstrate the acquired language in written and spoken contexts	3	1
CO3	express, restate and respond appropriately by comprehending the given data	3	1
CO4	develop proficiency to succeed in academic activities, research and career	3	1
CO5	excel in professional and social etiquette	3	1

DATA STRUCTURES THROUGH C

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-105	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	classify different data structures to design efficient programs	3	3	2	2
CO2	identify appropriate sorting and searching techniques	3	2	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	explain various concepts of non-linear data structures	3	3	2	2
CO5	choose an appropriate hashing technique for a given problem	3	3	2	2

COMPUTER AIDED ENGINEERING GRAPHICS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-107	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2

APPLIED PHYSICS LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-104	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	demonstrate the electrical properties of a semiconductor	3
CO2	compare practical results with theoretical calculations in electrical circuits	3
CO3	demonstrate the properties of lasers and optical fibers	3
CO4	find the energy gap of a semiconductor and identify its band structure	3
CO5	examine electrical resonance in LCR circuits	3



ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-HSMC-102	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	identify the nuances of the language through multimedia experience	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3
CO4	develop speaking and listening skills	3	3
CO5	appraise communication and correspond effectively	3	3

DATA STRUCTURES THROUGH C LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-106	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	implement various searching and sorting techniques	3
CO2	demonstrate basic operations of stack and queues using arrays and linked lists	3
CO3	apply stack data structure to solve various computing problems	3
CO4	demonstrate and apply different methods for traversing graphs	3
CO5	construct binary search tree	3

ENVIRONMENTAL SCIENCE MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-MC-102	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2

STATISTICAL FOUNDATIONS FOR COMPUTER SCIENCE

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-BSC-201	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the concepts of probability and random variables	3	2	1
CO2	illustrate the importance of discrete, continuous and sampling distributions	3	2	1
CO3	use various estimation methods and test hypothesis for large samples	3	2	1
CO4	test hypothesis for small samples and find correlation/regression analysis	3	2	1



CO5	apply the theory of stochastic processes to analyze classification of states	3	2	1
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DISCRETE MATHEMATICS & GRAPH THEORY

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-208	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	verify logical statements using connectives	3	3	2
CO2	validate arguments using predicate calculus	3	3	2
CO3	perform various operations with relational algebra	3	3	2
CO4	solve problems using combinatorics	3	3	2
CO5	simplify real-life situations using graph theory	3	3	3

DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-209	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12
CO1	interpret number systems and logical functions using K-Maps	3	3	2	2	2
CO2	design various combinational and sequential circuits	3	3	2	2	3
CO3	illustrate computer components and function of 8086 processor	3	3	2	2	2
CO4	analyze arithmetic operations and I/O operations	3	3	2	2	3
CO5	distinguish various memories and pipelining operations	3	3	2	2	3

DATABASE MANAGEMENT SYSTEMS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CS-PC-211	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design simple databases using basic concepts of database architectures	3	3	3	2
CO2	construct databases using ER Modelling	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	2
CO4	apply normalization on database to eliminate redundancy	3	3	3	2
CO5	illustrate the mechanisms of transaction management, concurrency control and recovery system	3	3	3	2

PYTHON PROGRAMMING

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CS-PC-212	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	perceive the fundamentals of python programming	3	3	2	2
CO2	develop programs using control statements	3	3	2	2



CO3	analyze the programming performances using functions	3	3	2	2
CO4	make use of collections in python programming	3	3	3	2
CO5	design classes and build error-free codes	3	3	3	3

DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-210	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	design logic gates using NAND and NOR gates	3	3
CO2	construct the combinational and sequential logic circuits	3	3
CO3	solve simple problems using ALP	3	3
CO4	implement string handling operations using ALP	3	3
CO5	develop programs using procedures and macros	3	3

DATABASE MANAGEMENT SYSTEMS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CS-PC-213	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	construct databases using SQL commands	3	3
CO2	apply normalization techniques to eliminate redundancy	3	3
CO3	design a database schema for a given domain	3	3
CO4	solve queries based on joins, nested queries and aggregate functions	3	3
CO5	execute PL / SQL programs for a given application	3	3

PYTHON PROGRAMMING LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CS-PC-214	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

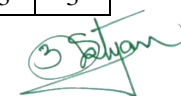
COs	Upon completion of course the students will be able to	PO4	PO5
CO1	write simple programs using python	3	3
CO2	develop programs using control statements	3	3
CO3	implement functions and file I/O operations	3	3
CO4	make use of lists and tuples in python	3	3
CO5	design simple GUI programs	3	3

BUSINESS COMMUNICATION SKILLS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-HSMC-201	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3



CO3	make use of soft skills to become a professional team member	3	3
CO4	apply knowledge of decision making, leadership, motivation	3	3
CO5	exhibit confidence in facing the interview process	3	3

GENDER SENSITIZATION LAB (MANDATORY COURSE- NON- CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-MC-201	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

AUTOMATA AND COMPILER DESIGN

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-221	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design various finite automata	3	3	3	2
CO2	write a context free grammar for a given language	3	3	3	2
CO3	construct various parsers, semantics and intermediate code forms	3	3	3	2
CO4	implement code optimization techniques	3	3	3	2
CO5	apply generic code generation algorithm to generate target code	3	3	3	2

DESIGN & ANALYSIS OF ALGORITHMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-222	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	measure time and space complexity of algorithms	3	3	3	3
CO2	solve problems using disjoint sets and divide-and-conquer techniques	3	3	2	2
CO3	apply greedy method and dynamic programming paradigm to solve the problems	3	3	2	2
CO4	adapt back-tracking and branch-bound methods to solve problems	3	3	2	2
CO5	interpret NP-hard and NP-complete problems	3	3	2	2

OOP THROUGH JAVA

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-223	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
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CO1	write simple java programs using OOP concepts	3	3	2	2
CO2	interpret programs using the concepts of inheritance, polymorphism, packages and interfaces	3	3	2	2
CO3	build efficient and error free codes using the concepts of multithreading and exception handling	3	3	3	3
CO4	design GUI programs using the concepts of AWT and event handling	3	3	3	2
CO5	develop real-time applications using applets and swings	3	3	3	3

COMPUTER NETWORKS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-224	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	outline the basics of computer networks and various layers	3	3	2	3
CO2	demonstrate multiple access protocols	3	3	2	3
CO3	interpret network layer and routing algorithms	3	3	3	3
CO4	illustrate internetworking and various transport protocols	3	3	3	3
CO5	make use of various protocols of application layer	3	3	2	3

OPERATING SYSTEMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-225	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	outline various concepts operating systems and Linux utilities	3	3	2
CO2	solve synchronization problems by using process management and API s	3	3	2
CO3	adapt various deadlock handling and memory management mechanism	3	3	2
CO4	analyze various file management system	3	3	2
CO5	make use of I/O Management and security mechanisms	3	3	2

OOP THROUGH JAVA LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-226	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	write, compile and execute simple java programs	3	3
CO2	develop programs using inheritance, polymorphism, packages and Interfaces	3	3
CO3	demonstrate multithreading and exception handling mechanisms	3	3
CO4	design GUI using the concepts of AWT and event handling	3	3
CO5	build real-time applications using applets and swings	3	3

OPERATING SYSTEMS (LINUX) LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-227	-	-	3	1.5



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO5	PSO2
CO1	illustrate Linux shell environment	3	3	3
CO2	create process using APIs	3	3	3
CO3	interpret various CPU scheduling algorithms and file allocation methods	3	3	3
CO4	experiment with page replacement and memory management	3	3	3
CO5	distinguish deadlock avoidance and deadlock prevention	3	3	3

APTITUDE AND CRITICAL THINKING SKILLS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-204	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	build proficiency in quantitative reasoning	3	3
CO2	improve critical thinking skills	3	3
CO3	enhance analytical skills	3	3
CO4	demonstrate quantitative aptitude concepts	3	3
CO5	adapt principles of quantitative aptitude to achieve qualitative results	3	3

SOCIAL INNOVATION LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-205	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	illustrate social innovation	3
CO2	identify the problems	3
CO3	choose suitable design processes	3
CO4	develop a prototype using suitable platform	3
CO5	prepare a report using project management techniques and ethics	3

INDIAN CULTURE AND CONSTITUTION MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-MC-202	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	1
CO2	explain features of languages, religions and holy books	3	2
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	2

SOFTWARE DESIGN AND ENGINEERING

Course	B.Tech.-V-Sem.	L	T	P	C
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Subject Code	20-CS-PC-311	3	-	-	3
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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO11	PO12	PSO1
CO1	identify & analyze software requirements and prepare SRS	3	3	3	3	3	3
CO2	design a system, component or process to meet the needs	3	3	3	3	3	3
CO3	make use of UML diagrams in software design	3	3	3	3	3	3
CO4	analyze various testing techniques by using various metrics	3	3	3	3	3	3
CO5	adapt risk management strategies to assure software quality	3	2	3	3	3	3

DATA MINING AND DATA ANALYTICS

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-312	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	summarize fundamentals of data mining	3	2	2	2	2
CO2	illustrate various mining association rules	3	3	2	2	3
CO3	make use of classification and clustering techniques	3	3	3	2	3
CO4	outline various data analytics techniques	3	2	2	2	3
CO5	solve statistical problems using R programming	3	3	3	3	3

INFORMATION AND CYBER SECURITY

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-313	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain information and cyber security terminologies	2	2	2	3	2	3
CO2	identify various cyber offences	3	3	3	3	3	3
CO3	apply cryptography for security networks	3	3	3	3	3	3
CO4	use standards and cyber laws to enhance cyber security	3	3	3	3	3	3
CO5	illustrate the importance of security policies & IT Act	3	3	3	3	3	3

ARTIFICIAL INTELLIGENCE

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-314	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12	PSO1
CO1	explain the concepts of artificial intelligence	3	3	3	3	2	3
CO2	illustrate various search algorithms	3	3	3	3	2	3
CO3	adapt various probabilistic reasoning approaches	3	3	2	3	3	3
CO4	elaborate Markov decision process	3	3	2	3	2	3
CO5	perceive various reinforcement learning approaches	3	3	2	3	3	3



SOFT COMPUTING (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PE-311	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	use search techniques in AI problems	3	2	2	2	2	3
CO2	describe various supervise learning techniques	3	2	3	3	2	3
CO3	apply special networks in soft computing problems	3	3	3	3	3	3
CO4	implement fuzzy systems in engineering applications	3	2	3	3	3	3
CO5	perform various operations of genetic algorithms	3	3	3	3	3	3

GAMIFICATION (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PE-312	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12	PSO1
CO1	outline the importance of Gamification	3	2	2	3	3	2	3
CO2	make use of game elements	3	3	3	3	3	2	3
CO3	adapt theories of Gamification	3	3	3	3	3	3	3
CO4	apply Gamification to various learning domains	3	3	3	2	3	3	3
CO5	interpret Alternate Reality Games for Corporate Learning	3	2	3	3	3	3	3

DIGITAL MARKETING (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PE-313	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	outline the importance of digital marketing	2	1	2	3	3	3
CO2	use search engine optimization to achieve business goals	3	2	3	3	3	3
CO3	adapt social media for business promotion	3	3	3	3	3	3
CO4	identify link building techniques for content consideration	3	2	3	3	3	3
CO5	apply digital marketing techniques in real time applications	3	3	3	3	3	3

INFORMATION AND CYBER SECURITY LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-316	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
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CO1	explain concepts of cryptanalysis	3	3	3
CO2	Examine different vulnerability attacks	3	3	3
CO3	illustrate Wi-Fi security techniques	3	3	3
CO4	Able to do malware analysis.	3	3	3
CO5	Able to configure simple firewall and IT audit	3	3	3

ARTIFICIAL INTELLIGENCE LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-317	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	illustrate various search techniques	3	3	3
CO2	solve real-time problems using graph theory	3	3	3
CO3	develop various games using AI techniques	3	3	3
CO4	adapt Bayesian probability model	3	3	3
CO5	design programs based on Markov decision process	3	3	3

AUTOMATED TESTING TOOLS (SELENIUM) LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-318	1	-	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO8	PSO2
CO1	install JAVA, Associate SWD Jars and Browser drivers	3	2	2	3	3	3
CO2	devise website issues using automation	3	3	3	3	3	3
CO3	develop programs using web drivers	3	3	3	3	3	3
CO4	design test cases for validation of data	3	2	2	3	3	3
CO5	plan automation to address real time problems	3	3	3	3	3	3

SUMMER INTERNSHIP

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PR-311	-	-	-	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

CODING SKILLS MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-MC-301	1	-	2	-



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO12
CO1	solve real world problems using C & DS	3	3	3	3	3
CO2	solve real world problems using DBMS	3	3	3	3	3
CO3	solve real world problems using Python	3	3	3	3	3
CO4	solve real world problems using Java, HTML, JavaScript	3	3	3	3	3
CO5	solve real world problems using any one emerging technology	3	3	3	3	3

IOT WITH CLOUD COMPUTING

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PSO1
CO1	explain the concepts of IoT	3	2	3	3	3	3
CO2	illustrate the foundations of IoT	3	2	3	3	3	3
CO3	adapt protocol and standards of IoT	3	3	3	3	3	3
CO4	outline the importance of cloud in IoT	3	3	3	3	3	3
CO5	make use of cloud in IoT enabled spaces	3	2	3	3	3	3

MACHINE LEARNING AND DATA SCIENCE

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	demonstrate the required mathematical foundations for ML& DS	3	3	3	3	3
CO2	outline the functionalities of machine learning	3	3	3	3	3
CO3	illustrate learning algorithms & data science basics	3	3	2	2	3
CO4	build data science applications using Python based toolkits	3	3	3	3	3
CO5	use recommender systems and sentiment analysis in real time applications	3	3	3	3	3

FULL STACK WEB DEVELOPMENT

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	explain the concepts of full stack web development	3	2	2	3	3
CO2	illustrate High level programming and jQuery concepts	3	2	2	3	3
CO3	make use of Node.js and MongoDB Driver for web development	3	3	3	3	3
CO4	develop app using angularJS concepts	3	3	3	3	3
CO5	establish version control in GitHub	3	2	3	3	3



COMPUTER VISION (Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PE-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of geometric camera models	3	2	2	3	2	3
CO2	demonstrate light and shading	3	3	3	3	3	3
CO3	illustrate the concepts of colour in computer vision	3	3	2	3	2	3
CO4	make use of linear filters	3	3	2	3	2	3
CO5	adapt local image features	3	2	2	3	2	3

BLOCKCHAIN AND CRYPTOCURRENCY (Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PE-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the fundamentals of Blockchain techniques	3	2	2	3	3	3
CO2	analyze various consensus problems	3	3	3	3	2	3
CO3	adapt Blockchain technology to improve business	3	3	3	3	2	3
CO4	make use of Ethereum frameworks to write smart contract	3	3	3	3	2	3
CO5	interpret Blockchain technology in real time applications	3	3	3	3	2	3

AUGMENTED AND VIRTUAL REALITY (Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PE-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	illustrate taxonomy and features of AR systems	2	2	2	2	2	3
CO2	explain fundamentals of virtual reality	3	3	3	3	3	3
CO3	adapt geometric modeling in virtual reality environment	3	3	3	3	3	3
CO4	make use of virtual environment for animation	3	2	3	3	2	3
CO5	develop VR and AR applications	3	3	3	3	3	3

DISASTER MANAGEMENT (Open Elective - I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

ROBOTICS (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2
CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate sensors for robot	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

JAVA PROGRAMMING (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-324	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	create packages and interfaces	3	2	3	3	2
CO4	build efficient code using multithreading and exception handling	3	2	3	3	2
CO5	design real-time applications using applets	3	2	3	3	2



IOT WITH CLOUD COMPUTING LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-324	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	identify various IoT devices	3	3	3
CO2	use IoT devices in various applications	3	3	3
CO3	develop automation work-flow in IoT enabled cloud environment	3	3	3
CO4	take part in practicing and monitoring remotely	3	3	3
CO5	make use of various IoT protocols in cloud	3	3	3

MACHINE LEARNING AND DATA SCIENCE LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-325	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	illustrate the implementation procedures for the ML algorithms	3	3	3
CO2	demonstrate the ID3 classification algorithms	3	3	3
CO3	analyze k-Means clustering on different datasets	3	3	3
CO4	apply predictive algorithms on live data	3	3	3
CO5	identify the regression algorithms to solve real world problems	3	3	3

FULL STACK WEB DEVELOPMENT LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-326	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	illustrate implementation procedure of full stack web development	3	3	3
CO2	demonstrate HTML5, CSS5 scripting languages and Github	3	3	3
CO3	make use of scripting languages in web development	3	3	3
CO4	develop web applications using AJAX	3	3	3
CO5	build real time applications using full stack web development	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-HSMC-301	1	-	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3



CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3

HUMAN VALUES AND PROFESSIONAL ETHICS MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-MC-302	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO12
CO1	identify values and ethics and its relation to individual excellence	3	3	3	2
CO2	outline the ten commandments and try to apply in professional career	2	2	3	2
CO3	illustrate modern percepts of ethics, CSR and Corporate Governance	3	3	3	2
CO4	analyze the purpose of professional code of ethics and whistle blowing	3	3	3	2
CO5	practice student professional/technical societies/associations activities	3	3	3	3

BUSINESS ECONOMICS

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-HSMC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	outline the concepts of business management & economics	3	2
CO2	identify demand function to predict sales using linear regression	3	2
CO3	adapt production, price, market and cost analysis functions	3	2
CO4	estimate enterprise requirements under risky economic environment	2	3
CO5	assess the operational and financial performance of an enterprise	3	3

GO PROGRAMMING

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	illustrate the concepts of Go programming	2	3	2	3	3
CO2	demonstrate the variables of Go programming	2	2	2	3	3
CO3	outline functions and packages of Go programming	3	3	3	2	2
CO4	interpret servers of Go programming	3	3	3	3	3
CO5	make use of servers and concurrency in Go programming	3	3	3	2	3

NATURAL LANGUAGE PROCESSING (Professional Elective - III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PE-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain fundamentals of NLP and morphology	3	2	3	3	3	3

(Signature)

CO2	demonstrate word level statements and syntactic analysis	3	2	3	3	3	3
CO3	make use of context free grammar and parsing techniques	3	3	3	3	3	3
CO4	apply semantic analysis techniques to solve various problems	3	3	3	3	3	3
CO5	illustrate language generation and discourse analysis	3	2	3	3	3	3

ROBOTIC PROCESS AUTOMATION (Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CA-PE-412	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline the basics of RPA	3	3	2	3	3	3
CO2	implement RPA	3	3	3	3	3	3
CO3	demonstrate RPA tools and automation techniques	2	2	2	3	3	3
CO4	adapt RPA BOT Models	3	3	3	3	3	3
CO5	execute Orchestrator	3	3	3	3	3	3

DOCUMENT ANALYSIS AND SPEECH RECOGNITION (Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CA-PE-413	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain basics of document analysis & speech recognition	3	2	2	3	3	3
CO2	analyse various types of signatures	3	3	3	3	3	3
CO3	illustrate document creation and speech recognition	3	2	3	3	3	3
CO4	make use of techniques of speech feature extractions	3	2	3	3	3	3
CO5	demonstrate speech feature enhancement techniques	3	2	3	3	3	3

NEURAL NETWORKS AND DEEP LEARNING (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CA-PE-414	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	illustrate the functionalities of neural networks	3	3	2	3	3	3
CO2	analyze the single-layer and multi-layer perceptrons	3	3	3	3	3	3
CO3	interpret deep feed forward networks with regularization	3	3	3	3	3	3
CO4	demonstrate convolutional neural networks in deep learning	3	3	3	3	3	3
CO5	outline the importance of autoencoders	3	2	2	3	3	3

PATTERN RECOGNITION AND ANOMALY DETECTION (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CA-PE-415	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts pattern recognition	3	2	2	3	3	3
CO2	illustrate optimal classification	3	3	3	3	3	3
CO3	make use of classification techniques	3	3	3	3	3	3
CO4	adapt anomaly detection	3	3	3	3	3	3
CO5	demonstrate clustering based anomaly detection approaches	3	2	2	3	3	3

SOFTWARE PROCESS & PROJECT MANAGEMENT (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CA-PE-416	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain the concepts of Software process improvement	3	3	2	3	3	3
CO2	illustrate assessment phases and principles	3	3	3	3	3	3
CO3	adapt and establish software configuration management	2	2	2	3	3	3
CO4	use lifecycle phases in project maintenance	3	3	3	3	3	3
CO5	establish iterative process planning & automation	3	3	3	3	3	3

GREEN BUILDING TECHNOLOGIES (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO7	PO12
CO1	explain the fundamentals of energy use and processes in building	3	2	2	2
CO2	identify indoor environmental requirement and its management	3	3	3	2
CO3	assess the impact of solar radiation on buildings	3	3	3	2
CO4	evaluate end-use energy utilization and requirements	3	3	2	2
CO5	adapt audit procedures for energy management	3	3	3	2

DRONES (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-412	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO7	PO12
CO1	explain concepts of creative industries	3	3	3	3	3	3
CO2	outline the needs of creative industries	3	3	3	3	3	3
CO3	illustrate deployment and deadly abilities of drones	3	3	3	3	3	3
CO4	adapt price based data routing in dynamic IoT	3	3	3	3	3	3
CO5	make use of security in UAV/Drone communications	3	3	3	3	3	3

5G TECHNOLOGIES (Open Elective-II)



Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-413	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain basic principles of 5G communication	3	3	2	2	3	3	3
CO2	identify the 5G new radio, core network, mobile networks	3	3	2	2	3	3	3
CO3	analyze the physical architecture of 5G and its challenges	3	3	2	2	3	3	3
CO4	design the modulation and multiple access technique for 5G	3	3	2	2	3	3	3
CO5	evaluate the various channels, layers and links used in 5G	3	3	2	2	3	3	3

DATABASE MANAGEMENT SYSTEMS (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-414	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2

GO PROGRAMMING LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PC-412	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	write simple programs using Go programming concepts	3	3	3
CO2	articulate the variables of Go programming	3	3	3
CO3	make use of functions and packages of Go programming	3	3	3
CO4	pivot servers of Go programming	3	3	3
CO5	prioritize servers and concurrency in Go programming	3	3	3

INDUSTRY ORIENTED MINI-PROJECT

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CA-PR-411	-	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3



GENETIC ALGORITHMS AND APPLICATIONS (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CA-PE-421	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the concepts of genetic algorithms	3	2	2	2	3	3
CO2	illustrate solution spaces in genetic algorithms	3	3	3	2	3	3
CO3	adapt advanced concepts of genetic algorithms	3	3	3	3	3	3
CO4	use genetic programming in real-time applications	3	2	2	3	3	3
CO5	demonstrate particle swarm and ant colony optimization	3	2	2	3	3	3

AI IN HEALTHCARE (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CA-PE-422	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline the concepts of AI in healthcare	3	3	2	2	3	3
CO2	explain the potentials of AI in Healthcare	3	2	3	3	3	3
CO3	use timeliness and ethics in AI based healthcare systems	3	2	2	3	3	3
CO4	illustrate future of healthcare in technological perspective	3	2	2	2	3	3
CO5	adapt AI in healthcare management systems	3	3	3	3	3	3

NATURE INSPIRED COMPUTING (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CA-PE-423	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of Nature Inspired Computing	3	3	2	2	3	3
CO2	develop programs using the concepts of Genetic Algorithms	3	3	3	2	3	3
CO3	make use of Swarm Intelligence and immunocomputing	3	3	3	3	3	3
CO4	show self-tuning algorithms	3	2	3	3	3	3
CO5	describe nature inspired computing for artificial life	3	2	2	2	3	3

COGNITIVE COMPUTING (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CA-PE-424	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of cognitive computing	3	3	3	3	3	3



CO2	illustrate complex relationship between systems	3	3	3	3	3	3
CO3	describe the hypothesis and design principle of cognitive system	3	3	3	3	3	3
CO4	show the business implications of cognitive computing	3	3	3	3	3	3
CO5	articulate future applications of cognitive computing	3	2	2	3	3	3

ARTIFICIAL IMMUNE SYSTEM (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CA-PE-425	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of human immune system	3	2	2	3	3	3
CO2	demonstrate malware detection in context of immunity	3	3	3	3	3	3
CO3	use malware detection approaches and immunity model	3	2	2	3	3	3
CO4	adapt feature-based negative selection algorithm	3	2	2	3	3	3
CO5	illustrate immune concentration-based malware detection	3	3	3	3	3	3

AI IN ROBOTICS (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CA-PE-426	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the concepts of AI application in robotics	3	3	2	2	3	3
CO2	demonstrate control paradigms of mobile robots	3	3	2	2	3	3
CO3	make use of AI tools and software in robotics	3	3	3	3	3	3
CO4	illustrate swarm robotics	3	3	3	3	3	3
CO5	adapt human robot interaction	3	2	2	3	3	3

INTELLECTUAL PROPERTY RIGHTS (Open Elective-III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-421	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO8	PO12
CO1	outline basics of intellectual property law	3	3	3	3
CO2	identify the various trademarks	3	3	3	3
CO3	analyze patent and copy rights law	3	3	3	3
CO4	differentiate trade secret and unfair practice	3	2	3	2
CO5	summarize new developments in Intellectual Property Rights	3	3	3	3

PRINCIPLES OF ENTREPRENEURSHIP (Open Elective - III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
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Subject Code	20-OEC-422	3	-	-	3
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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3

**PRECISION AGRICULTURE
(Open Elective – III)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-423	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO2
CO1	explain the concepts of precision agriculture	3	3	3	3	3	3
CO2	outline the components of precision agriculture	3	3	3	3	3	3
CO3	illustrate about tools technologies and sampling	3	3	3	3	3	3
CO4	adapt recent advances in precision agriculture	3	3	3	3	3	3
CO5	make use of feasibility and evaluation of precision farming	3	3	3	3	3	3

**WEB TECHNOLOGIES
(Open Elective – III)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-424	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2

MAJOR PROJECT

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CA-PR-421	-	-	20	10

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3



**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(AI&ML) (R22)
MATRICES AND CALCULUS**

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22BS11	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	verify mean value theorems and evaluate improper integrals	3	2	1
CO4	find the extreme values of functions of several variables	3	2	1
CO5	evaluate multiple integrals and apply them to find areas and volumes	3	2	1

APPLIED PHYSICS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22BS12	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the principles of Quantum Physics and band theory of solids	3	2	1
CO2	classify semiconductors and relate functioning of semiconductor devices	3	2	1
CO3	outline the concepts of dielectric, magnetic and energy materials	3	2	1
CO4	use fabrication and characterization techniques of nano-materials	3	2	1
CO5	illustrate principles and applications of lasers and optical fibers	3	2	1

ENGLISH FOR SKILL ENHANCEMENT

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22HS11	2	-	-	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in LSRW skills	3	2
CO2	demonstrate the acquired language in written and spoken contexts	3	2
CO3	express, restate and respond appropriately by comprehending the given data	3	2
CO4	develop proficiency to succeed in academic activities, research and career	3	2
CO5	excel in professional and social etiquette	3	2

PROGRAMMING FOR PROBLEM SOLVING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22ES12	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
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CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data and file handling	3	3	2	2
CO5	implement various searching and sorting techniques in C programming	3	3	2	2

ELEMENTS OF COMPUTER SCIENCE & ENGINEERING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22ES13	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PO9	PO12
CO1	explain the functions of a basic computer and PL	3	3	3	3	3	3	3
CO2	describe the need of OS, database systems and SE	3	3	3	3	3	3	3
CO3	illustrate networks, internet, WWW and security	3	3	3	3	3	3	3
CO4	outline the concepts of AI & ML	3	3	3	3	3	3	3
CO5	demonstrate concepts of DS and autonomous systems	3	3	3	3	3	3	3

APPLIED PHYSICS LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22BS13	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO9
CO1	calculate the Planck's constant, Hall co-efficient and Energy gap of semiconductors	3	3
CO2	examine the working of semiconductor and optoelectronic devices	3	3
CO3	demonstrate the behavior of magnetic and dielectric materials	3	3
CO4	demonstrate the properties of laser and optical fiber	3	3
CO5	compare practical results with theoretical calculations in electrical circuits	3	3

ENGLISH LANGUAGE LABORATORY FOR EFFECTIVE COMMUNICATION

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22HS12	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO9	PO10
CO1	identify the nuances of the language through multimedia experience	3	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3	3
CO4	develop speaking and listening skills	3	3	3
CO5	appraise communication and correspond effectively	3	3	3



PROGRAMMING FOR PROBLEM SOLVING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22ES16	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	execute simple programs using C compiler	3	3	3
CO2	apply control statements in designing programs	3	3	3
CO3	design programs using functions, arrays, strings and pointers	3	3	3
CO4	construct programs for heterogeneous data and file operations	3	3	3
CO5	implement various searching and sorting techniques in C programming	3	3	3

IT WORKSHOP PRACTICE

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	22ES18	-	1	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	classify hardware components and inter dependencies	3	3	2	2
CO2	install operating systems and MS office	3	3	2	2
CO3	configure IP and trouble shoot network connections	3	3	3	2
CO4	use internet and safeguard computer systems from viruses/worms	3	3	3	2
CO5	prepare documentation/presentation by using office tools	3	3	3	2

ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22BS21	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	identify whether the given differential equation of first order is exact or not	3	2	1
CO2	solve ordinary differential equations of higher order	3	2	1
CO3	use the Laplace transforms techniques for solving ODE's	3	2	1
CO4	find vector differentiation of vector & scalar field/gradient/divergence/curl	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

ENGINEERING CHEMISTRY

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22BS24	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1

(Signature)

CO4	illustrate the various fuels, synthesis of polymers	3	2	1
CO5	analyze and understand the properties, applications of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22ES21	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	elaborate the concepts of network theorems & single phase AC circuits	3	3	2	1
CO3	explain three phase AC circuits and P-N Junction Diode	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1

DATA STRUCTURES THROUGH PYTHON

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22ES22	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the fundamentals of python programming	3	3	2	2
CO2	develop programs using collections, classes and build error-free codes	3	3	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	make use of various concepts of non-linear data structures	3	3	3	2
CO5	design data structures using graphs	3	3	3	3

ENGINEERING CHEMISTRY LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22BS25	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO9
CO1	determine the hardness in water samples to solve societal problems	3	3
CO2	estimate the strength of the given solutions	3	3
CO3	determine surface tension, Acid value and viscosity of various fluids	3	3
CO4	analyze the rate of corrosion of mild steel in various conditions	3	3
CO5	verify and understand the distribution coefficient	3	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22ES23	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO9
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CO1	design electrical circuits to verify circuit laws	3	3
CO2	evaluate network theorems	3	3
CO3	verify the V-I characteristics of various electronic devices	3	3
CO4	determine the efficiency of various rectifiers	3	3
CO5	illustrate the configurations of Bi-polar junction transistor	3	3

DATA STRUCTURES THROUGH PYTHON LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22ES24	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	write simple programs using python	3	3	3
CO2	develop programs using collections and classes	3	3	3
CO3	construct different linear data structures along with their operations	3	3	3
CO4	implement various search trees	3	3	3
CO5	design programs for traversing graphs	3	3	3

COMPUTER AIDED ENGINEERING GRAPHICS LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22ES25	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	3	3
CO2	construct conic sections using various methods	3	3	3	3
CO3	draw orthographic projections of points, lines, planes and solids	3	3	3	3
CO4	draw development of solid surfaces	3	3	3	3
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	3	3

DESIGN THINKING FOR INNOVATION AND STARTUPS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22ES27	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO12	PSO1	PSO2
CO1	illustrate the design thinking practices for value based innovation	3	3	3
CO2	analyze stakeholder behaviour and empathy in ideation	3	3	3
CO3	develop and test prototype for its scalability	3	3	3
CO4	identify and standardize business process	3	3	3
CO5	prepare a startup pitch	3	3	3

ENVIRONMENTAL SCIENCE & DISASTER MANAGEMENT MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	22MC21	2	-	-	-



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	explain the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	identify solutions for sustainable development and pollution control	3	3	3	2
CO4	analyze various types of disasters	3	3	3	3
CO5	develop strategies for preparedness measures against disasters	3	3	3	2

STATISTICAL FOUNDATIONS FOR COMPUTER SCIENCE

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22BS31	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the concepts of probability and random variables	3	2	1
CO2	illustrate the importance of discrete, continuous and sampling distributions	3	2	1
CO3	use various estimation methods and test hypothesis for large samples	3	2	1
CO4	test hypothesis for small samples and find correlation/regression analysis	3	2	1
CO5	apply the theory of stochastic processes to analyze classification of states	3	2	1

DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22ES32	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12
CO1	interpret number systems and logical functions using K-Maps	3	3	2	2	2
CO2	design various combinational and sequential circuits	3	3	2	2	3
CO3	illustrate computer components and function of 8086 processor	3	3	2	2	2
CO4	analyze arithmetic operations and I/O operations	3	3	2	2	3
CO5	distinguish various memories and pipelining operations	3	3	2	2	3

SOFTWARE DESIGN AND ENGINEERING

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CAPC31	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO11	PO12	PSO1
CO1	identify & analyze software requirements and prepare SRS	3	3	3	3	3	3
CO2	design a system, component or process to meet the needs	3	3	3	3	3	3
CO3	make use of UML diagrams in software design	3	3	3	3	3	3
CO4	analyze various testing techniques by using various metrics	3	3	3	3	3	3
CO5	adapt risk management strategies to assure software quality	3	2	3	3	3	3



OOP THROUGH JAVA

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CAPC32	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple java programs using OOP concepts	3	3	2	2
CO2	interpret programs using OOP concepts	3	3	2	2
CO3	build efficient codes using multithreading and exception handling	3	3	3	3
CO4	design GUI programs using AWT and event handling	3	3	3	2
CO5	develop real-time applications using applets and swings	3	3	3	3

DATABASE MANAGEMENT SYSTEMS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CAPC33	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design simple databases using database architectures	3	3	3	2
CO2	construct databases using ER Modelling	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	2
CO4	apply normalization on database to eliminate redundancy	3	3	3	2
CO5	explain transaction processing and concurrency control	3	3	3	2

OOP THROUGH JAVA LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CAPC34	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	write, compile and execute simple java programs	3	3	3
CO2	develop programs using inheritance, polymorphism, packages and Interfaces	3	3	3
CO3	demonstrate multithreading and exception handling mechanisms	3	3	3
CO4	design GUI using the concepts of AWT and event handling	3	3	3
CO5	build real-time applications using applets and swings	3	3	3

DATABASE MANAGEMENT SYSTEMS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CAPC35	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	construct databases using SQL commands	3	3	3
CO2	apply normalization techniques to eliminate redundancy	3	3	3
CO3	design a database schema for a given domain	3	3	3



CO4	solve queries based on joins, nested queries and aggregate functions	3	3	3
CO5	execute PL/SQL programs for a given application	3	3	3

DATA WRANGLING AND VISUALIZATION – PYTHON/ R PROGRAMMING/POWER BI

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CAPC36	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO9	PO12	PSO2
CO1	create python shell script for data validation	3	3	3	3	3	3
CO2	demonstrate how to import data into tableau	3	3	3	3	3	3
CO3	apply the tableau concepts of dimensions and measures	3	3	3	3	3	3
CO4	develop programs, map visual layouts and graphical properties	3	3	3	3	3	3
CO5	create a dashboard that links multiple visualizations	3	3	3	3	3	3

APP DEVELOPMENT - ANDROID/FLUTTER/FLASK

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CAPC37	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO9	PO12	PSO2
CO1	demonstrate android/flutter/flask installation	3	3	3	3	3	3
CO2	develop various applications using android	3	3	3	3	3	3
CO3	design various applications using flutter	3	3	3	3	3	3
CO4	implement various applications using flask	3	3	3	3	3	3
CO5	solve real-world problems using android/flutter/flask	3	3	3	3	3	3

GENDER SENSITIZATION (MANDATORY COURSE - NON-CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22MC31	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

EMPLOYABILITY SKILLS – I MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22MC32	-	-	3	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3
CO3	build proficiency in quantitative reasoning	3	3
CO4	improve critical thinking skills	3	3
CO5	exhibit confidence in facing the interview process	3	3

DISCRETE MATHEMATICS & GRAPH THEORY

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22ES41	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	verify logical statements using connectives	3	3	2
CO2	validate arguments using predicate calculus	3	3	2
CO3	perform various operations with relational algebra	3	3	2
CO4	solve problems using combinatorics	3	3	2
CO5	simplify real-life situations using graph theory	3	3	3

DESIGN AND ANALYSIS OF ALGORITHMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22CAPC41	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	measure time and space complexity of algorithms	3	3	3	3
CO2	solve problems using disjoint sets and divide-and-conquer techniques	3	3	2	2
CO3	apply greedy method and dynamic programming paradigm to solve the problems	3	3	2	2
CO4	adapt back-tracking and branch-bound methods to solve problems	3	3	2	2
CO5	interpret NP-hard and NP-complete problems	3	3	2	2

COMPUTER NETWORKS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22CAPC42	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	outline the basics of computer networks and various layers	3	3	2	3
CO2	demonstrate multiple access protocols	3	3	2	3
CO3	interpret network layer and routing algorithms	3	3	3	3
CO4	illustrate internetworking and various transport protocols	3	3	3	3
CO5	make use of various protocols of application layer	3	3	2	3



OPERATING SYSTEMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22CAPC43	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	outline various concepts operating systems and Linux utilities	3	3	2
CO2	solve synchronization problems by using process management and APIs	3	3	2
CO3	adapt various deadlock handling and memory management mechanism	3	3	2
CO4	analyze various file management system	3	3	2
CO5	make use of I/O Management and security mechanisms	3	3	2

FULL STACK DEVELOPMENT

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22CAPC44	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	explain the concepts of HTML5 and version control	3	2	2	3	3
CO2	illustrate java script and jQuery concepts	3	2	2	3	3
CO3	use Node.js and MongoDB Driver for web development	3	3	3	3	3
CO4	develop app using Angular concepts	3	3	3	3	3
CO5	design app using ReactJS concepts	3	2	3	3	3

CN & OS (LINUX) LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22CAPC45	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO5	PO9	PSO2
CO1	implement datalink protocols	3	3	3	3
CO2	find shortest path using routing table	3	3	3	3
CO3	illustrate Linux shell environment	3	3	3	3
CO4	interpret CPU scheduling algorithms and file allocation methods	3	3	3	3
CO5	experiment with page replacement and memory management	3	3	3	3

NODE JS/ANGULAR/REACT JS/DJANGO

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22CAPC46	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PO12	PSO2
CO1	build website with HTML5, CSS, Bootstrap and JavaScript	3	3	3	3	3
CO2	demonstrate JavaScript using NodeJS and MongoDB	3	3	3	3	3
CO3	develop single page application using Angular	3	3	3	3	3
CO4	develop single page application using React JS	3	3	3	3	3



CO5	design web application using Django	3	3	3	3	3
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AUTOMATED TESTING TOOLS - SELENIUM

Course	B.Tech.- IV-Sem.	L	T	P	C
Course Code	22CAPC47	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO8	PO9	PO12	PSO2
CO1	install JAVA, Associate SWD Jars and Browser drivers	3	3	3	3	3	3	3
CO2	devise website issues using automation	3	3	3	3	3	3	3
CO3	develop programs using web drivers	3	3	3	3	3	3	3
CO4	design test cases for validation of data	3	3	3	3	3	3	3
CO5	plan automation to address real time problems	3	3	3	3	3	3	3

REAL TIME/SOCIETAL RESEARCH PROJECT

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22CAPR41	-	-	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify relevant problem and design & develop a prototype	3
CO2	execute project using modern tools and prepare the report	3
CO3	exhibit leadership and managerial skills in project development	3
CO4	function effectively as individual, member and/or leader in project teams	3
CO5	apply engineering knowledge for societal sustenance	3

INDIAN CULTURE AND CONSTITUTION MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22MC41	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	1
CO2	explain features of languages, religions and holy books	3	2
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	2

EMPLOYABILITY SKILLS – II MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22MC42	-	-	3	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO9	PO10
CO1	make use of soft skills to become a professional team member	3	3
CO2	develop professional correspondence skills	3	3
CO3	apply knowledge of decision making, leadership, motivation	3	3
CO4	adapt principles of quantitative aptitude to achieve qualitative results	3	3
CO5	exhibit confidence in facing the interview process	3	3

AUTOMATA AND COMPILER DESIGN

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CAPC51	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design various finite automata	3	3	3	2
CO2	write a context free grammar for a given language	3	3	3	2
CO3	construct various parsers, semantics and intermediate code forms	3	3	3	2
CO4	implement code optimization techniques	3	3	3	2
CO5	apply generic code generation algorithm to generate target code	3	3	3	2

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CAPC52	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12	PSO1
CO1	illustrate the concepts of AI and various search algorithms	3	3	3	3	3	3
CO2	adapt knowledge representation and probabilistic reasoning	3	3	3	3	2	3
CO3	explain expert systems and concepts of machine learning	3	3	2	3	3	3
CO4	classify various supervised learning algorithms	3	3	2	3	2	3
CO5	demonstrate the various unsupervised learning algorithms	3	3	2	3	3	3

DATA MINING AND DATA ANALYTICS

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CAPC53	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	summarize fundamentals of data mining	3	2	3	3	2
CO2	illustrate various mining association rules	3	3	2	2	3
CO3	make use of classification and clustering techniques	3	3	3	2	3
CO4	outline various data analytics techniques	3	2	2	2	3
CO5	solve statistical problems using R programming	3	3	3	3	3



INFORMATION AND CYBER SECURITY

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CAPC54	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain information and cyber security terminologies	2	2	2	3	2	3
CO2	apply cryptography for security networks	3	3	3	3	3	3
CO3	identify various cyber offences	3	3	3	3	3	3
CO4	use standards and cyber laws to enhance cyber security	3	3	3	3	3	3
CO5	illustrate the importance of security policies & IT Act	3	3	3	3	3	3

DIGITAL MARKETING (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CAPE51	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	outline the importance of digital marketing	2	1	2	3	3	3
CO2	use search engine optimization to achieve business goals	3	2	3	3	3	3
CO3	adapt social media for business promotion	3	3	3	3	3	3
CO4	identify and register a domain	3	2	3	3	3	3
CO5	apply digital marketing techniques in real time applications	3	3	3	3	3	3

SOFT COMPUTING (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CAPE52	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	use search techniques in AI problems	3	2	2	2	2	3
CO2	describe various supervised learning techniques	3	2	3	3	2	3
CO3	apply special networks in soft computing problems	3	3	3	3	3	3
CO4	implement fuzzy systems in engineering applications	3	2	3	3	3	3
CO5	perform various operations of genetic algorithms	3	3	3	3	3	3

MIDDLEWARE TECHNOLOGIES (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CAPE53	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the basic concepts of middleware elements	3	3	3	2	2	2
CO2	develop XML for a data source based website	3	3	3	3	3	2
CO3	make use of ASP.NET to implement database access	3	3	3	3	3	2
CO4	organize application and session states	3	3	3	3	2	2
CO5	demonstrate web services	3	3	3	3	3	2

IMAGE PROCESSING (Professional Elective -I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CAPE54	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of image	3	2	2	2	3	3
CO2	illustrate image enhancement techniques	3	3	3	2	3	3
CO3	adapt image restoration to refine an image	3	3	3	3	3	3
CO4	use image processing color enhancement	3	2	2	3	3	3
CO5	demonstrate image segmentation & compression	3	2	2	3	3	3

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CAPC55	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	illustrate various search techniques	3	3	3	3
CO2	solve real-time problems using graph theory	3	3	3	3
CO3	use techniques of knowledge representation and probabilistic reasoning	3	3	3	3
CO4	design various supervised learning algorithms	3	3	3	3
CO5	implement various unsupervised learning algorithms	3	3	3	3

DATA MINING AND DATA ANALYTICS LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CAPC56	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	make use of open source data mining and analytic tools	3	3	3	3
CO2	examine the interesting insights of Apriori algorithm using WEKA	3	3	3	3
CO3	demonstrate the classification and clustering techniques	3	3	3	3
CO4	analyze the concepts of data analytics and statistical testing methods	3	3	3	3
CO5	compare various kinds of regression techniques	3	3	3	3



INFORMATION AND CYBER SECURITY LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CAPC57	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	explain concepts of cryptanalysis	3	3	3	3
CO2	Examine different vulnerability attacks	3	3	3	3
CO3	illustrate Wi-Fi security techniques	3	3	3	3
CO4	Able to do malware analysis.	3	3	3	3
CO5	Able to configure simple firewall and IT audit	3	3	3	3

AUTOMATED WRITING TOOLS - ChatGPT

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CAPC58	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO8	PO9	PO12	PSO2
CO1	develop content using ChatGPT	3	3	3	3	3	3	3
CO2	plan data simulation using ChatGPT	3	3	3	3	3	3	3
CO3	sketch images using ChatGPT	3	3	3	3	3	3	3
CO4	take a part in validation of data using ChatGPT	3	3	3	3	3	3	3
CO5	modify research content using ChatGPT	3	3	3	3	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22HS51	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO9	PO10
CO1	assess and utilize vocabulary in an effective way	3	3	3
CO2	interpret interpersonal relationships	3	3	3
CO3	elaborate academic reading and writing skills	3	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3	3

ENVIRONMENTAL SCIENCE & DISASTER MANAGEMENT MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22MC51*	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	explain the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2



CO3	identify solutions for sustainable development and pollution control	3	3	3	2
CO4	analyze various types of disasters	3	3	3	3
CO5	develop strategies for preparedness measures against disasters	3	3	3	2

IOT AND CLOUD COMPUTING

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CAPC61	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PSO1
CO1	explain the concepts of IoT	3	2	3	3	3	3
CO2	illustrate the foundations of IoT	3	2	3	3	3	3
CO3	adapt protocol and standards of IoT	3	3	3	3	3	3
CO4	outline the importance of cloud in IoT	3	3	3	3	3	3
CO5	make use of cloud in IoT enabled spaces	3	2	3	3	3	3

ROBOTIC PROCESS AUTOMATION

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CAPC62	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	outline the basics of RPA	3	3	3	3	3
CO2	implement RPA	3	3	3	3	3
CO3	demonstrate RPA tools and automation techniques	2	2	3	3	3
CO4	adapt RPA BOT Models	3	3	3	3	3
CO5	execute Orchestrator	3	3	3	3	3

NATURAL LANGUAGE PROCESSING

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CAPC63	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PSO1
CO1	explain fundamentals of NLP and morphology	3	2	3	3	3
CO2	demonstrate word level statements and syntactic analysis	3	2	3	3	3
CO3	make use of context free grammar and parsing techniques	3	3	3	3	3
CO4	apply semantic analysis techniques to solve various problems	3	3	3	3	3
CO5	illustrate language generation and discourse analysis	3	2	3	3	3

DATA SCIENCE AND BIG DATA ANALYTICS (Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CAPE61	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
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CO1	explain the basics of data science and big data analytics	3	3	3	3	3	3
CO2	illustrate exploratory data analysis	3	3	3	3	3	3
CO3	use advanced analytical theory and methods	3	3	3	2	2	3
CO4	sketch SQL commands for big data	3	3	3	3	3	3
CO5	describe data visualization	3	3	3	3	3	3

KNOWLEDGE REPRESENTATION AND REASONING (Professional Elective – II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CAPE62	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the concepts of knowledge representation	3	2	2	3	3	3
CO2	make use of knowledge engineering	3	3	2	3	3	3
CO3	use computational intractability features	3	3	3	3	3	3
CO4	demonstrate facts and rules in algorithm design	3	3	3	3	3	3
CO5	discuss about the rules of a production system	3	3	2	3	3	3

ADVANCED MACHINE LEARNING (Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CAPE63	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	use Deep belief networks and CNN	3	3	2	2	3	3
CO2	classify autoencoders and CNN	3	3	3	2	2	3
CO3	illustrate semi-supervised learning and categorization	3	3	3	3	3	3
CO4	apply feature engineering	3	3	3	3	2	3
CO5	design application using ensemble methods	3	2	2	2	2	3

BLOCKCHAIN AND CRYPTOCURRENCY (Professional Elective -II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CAPE64	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the fundamentals of Blockchain techniques	3	2	2	3	3	3
CO2	analyze various consensus problems	3	3	3	3	3	3
CO3	adapt Blockchain technology to improve business	3	3	3	3	3	3
CO4	make use of ethereum frameworks to write smart contract	3	3	3	3	3	3
CO5	interpret Blockchain technology in real time applications	3	3	3	3	3	3



E-COMMERCE (Open Elective - I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22OE61	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO8	PO9	PO10	PO12
CO1	outline the concepts of E-Commerce	3	2	2	3	3
CO2	develop supporting environment for E-Commerce	3	2	3	3	3
CO3	make use of technology in E-Commerce	3	3	3	3	3
CO4	adapt payment technologies in E-Commerce	3	3	3	3	3
CO5	implement security in E-Commerce	3	3	3	3	3

AGILE METHODOLOGIES (Open Elective - I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22OE62	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12
CO1	explain the concepts of agile methodology	3	2	3	3	3
CO2	make use of agile process	3	3	3	3	3
CO3	illustrate agility and knowledge management	3	3	3	3	3
CO4	adapt agility and requirements engineering	3	3	3	3	3
CO5	outline the importance agility and quality assurance	3	2	3	3	3

ELECTRONIC SENSORS (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22OE63	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO8	PO12
CO1	analyze the characterization of sensors	3	3	2	2	3	3
CO2	illustrate thermal embedded system	3	2	3	3	3	3
CO3	adapt magnetic sensors	3	3	3	2	3	3
CO4	make use of radiation sensors	3	3	3	2	3	3
CO5	design a system with sensors	3	2	3	2	3	3

IOT AND CLOUD COMPUTING LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CAPC64	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	identify various IoT devices	3	3	3	3



CO2	use IoT devices in various applications	3	3	3	3
CO3	develop automation work-flow in IoT enabled cloud environment	3	3	3	3
CO4	take part in practicing and monitoring remotely	3	3	3	3
CO5	make use of various IoT protocols in cloud	3	3	3	3

ROBOTIC PROCESS AUTOMATION LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CAPC65	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	install RPA packages	3	3	3	3
CO2	apply variables, data types, control statements in designing RPA	3	3	3	3
CO3	make use of data manipulation, recording and scrapping techniques	3	3	3	3
CO4	use selectors, data tables in excel for automation	3	3	3	3
CO5	develop email and PDF automation	3	3	3	3

NATURAL LANGUAGE PROCESSING LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CAPC66	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	examine word in NLP	3	3	3	3
CO2	test N-Grams in NLP	3	3	3	3
CO3	execute skip gram model using NLP	3	3	3	3
CO4	implement Hidden Markov Model	3	3	3	3
CO5	apply chunking in unstructured text	3	3	3	3

INDUSTRY ORIENTED MINI PROJECT/INTERNSHIP

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO1
CO1	apply domain knowledge to solve identified industrial problem	3
CO2	use industrial processes involved in end product/service	3
CO3	exhibit communication skills, professional ethics and social responsibility	3
CO4	manage and lead project in coordination with functional team-members	3
CO5	execute the project that meets industry requirements	3

SKILLS ENHANCEMENT COURSE - DEVOPS

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CAPR61	-	-	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	identify DevOps workflow	3	3	3	3



CO2	use eclipse for DevOps	3	3	3	3
CO3	develop docker image	3	3	3	3
CO4	take part in grid deployment	3	3	3	3
CO5	make use of Jenkins framework in DevOps	3	3	3	3

ENTREPRENEURSHIP AND IPR MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22MC61	3	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO7	PO8	PO12
CO1	illustrate entrepreneurship principles	3	3	3	3
CO2	analyze entrepreneurs' mindset	3	3	3	3
CO3	develop Business Plan and incubate innovative ideas	3	3	3	3
CO4	identify entrepreneurs' challenges in light of legal environment	3	2	3	2
CO5	demonstrate various types of IPRs applicable	3	3	3	3

MANAGEMENT, ECONOMICS AND ACCOUNTANCY

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22HS71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	apply principles of management in professional career	3	2
CO2	make use of principles of economics for decision making	3	2
CO3	solve problems in the areas of production, cost and price	3	2
CO4	prepare balance sheet and maintain books of accounts	2	3
CO5	analyze financial performance of an enterprise	3	3

NEURAL NETWORKS AND DEEP LEARNING

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CAPC71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PSO1
CO1	illustrate the functionalities of neural networks	3	3	3	3	3
CO2	analyze the single-layer and multi-layer perceptrons	3	3	3	3	3
CO3	interpret deep feedforward networks with regularization	3	3	3	3	3
CO4	demonstrate convolutional neural networks in deep learning	3	3	3	3	3
CO5	outline the importance of autoencoders	3	2	3	3	3

COMPUTER VISION AND ROBOTICS (Professional Elective -III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CAPE71	3	-	-	3

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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of geometric camera models	3	2	2	3	2	3
CO2	demonstrate light and shading	3	3	3	3	2	3
CO3	illustrate the concepts of colour in computer vision	3	3	2	3	2	3
CO4	make use of linear filters and kinematics	3	3	2	3	2	3
CO5	adapt Stereopsis and Robotics	3	2	2	3	2	3

**DOCUMENT ANALYSIS AND SPEECH RECOGNITION
(Professional Elective – III)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CAPE72	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain basics of document analysis & speech recognition	3	2	2	3	3	3
CO2	analyze various types of signatures	3	3	3	3	3	3
CO3	illustrate document creation and speech recognition	3	2	3	3	3	3
CO4	make use of techniques of speech feature extractions	3	2	3	3	3	3
CO5	demonstrate speech feature enhancement techniques	3	2	3	3	3	3

**HUMAN COMPUTER INTERACTION
(Professional Elective – III)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CAPE73	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of human behaviour and memories	3	3	2	3	3	3
CO2	illustrate VR and 3D interaction	3	3	3	3	3	3
CO3	adapt interaction design	2	2	2	3	3	3
CO4	use design focus in iteration and prototyping	3	3	3	3	3	3
CO5	establish HCI in software process	3	3	3	3	3	3

**MACHINE LEARNING FOR HACKERS
(Professional Elective - III)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CAPE74	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain concepts of machine learning used by hackers	3	3	2	3	3	3
CO2	outline classification technique used in spam filtering	3	3	3	3	3	3
CO3	make use of ranking and regression techniques for data security	2	2	2	3	3	3
CO4	adapt regularization and optimization	3	3	3	3	3	3



CO5	illustrate social graphs for analyzing community data	3	3	3	3	3	3
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GENETIC ALGORITHMS AND APPLICATIONS (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CAPE75	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the concepts of genetic algorithms	3	2	2	2	3	3
CO2	illustrate solution spaces in genetic algorithms	3	3	3	2	3	3
CO3	adapt advanced concepts of genetic algorithms	3	3	3	3	3	3
CO4	use genetic programming in real-time applications	3	2	2	3	3	3
CO5	demonstrate particle swarm and ant colony optimization	3	2	2	3	3	3

PATTERN RECOGNITION AND ANOMALY DETECTION (Professional Elective -IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CAPE76	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts pattern recognition	3	2	2	3	3	3
CO2	illustrate optimal classification	3	3	3	3	3	3
CO3	make use of classification techniques	3	3	3	3	3	3
CO4	adapt anomaly detection	3	3	3	3	3	3
CO5	demonstrate clustering based anomaly detection approaches	3	2	2	3	3	3

QUANTUM COMPUTING (Professional Elective – IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Course Code	22CAPE77	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the concepts of quantum computing	3	2	2	2	2	3
CO2	use mathematical foundations for quantum computing	3	3	3	2	2	3
CO3	outline the architecture and programming models	3	2	2	2	3	3
CO4	utilize basic techniques of quantum computing	3	3	3	3	2	3
CO5	elaborate major algorithms and discuss about OSS toolkits	3	3	3	3	3	3

SOFTWARE PROCESS & PROJECT MANAGEMENT (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CAPE78	3	-	-	3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain the concepts of Software process improvement	3	3	2	3	3	3
CO2	illustrate assessment phases and principles	3	3	3	3	3	3
CO3	adapt and establish software configuration management	2	2	2	3	3	3
CO4	use lifecycle phases in project maintenance	3	3	3	3	3	3
CO5	establish iterative process planning & automation	3	3	3	3	3	3

**CHATBOTS
(Open Elective-II)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22OE71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO8	PO12
CO1	summarize chatbots and growth of internet	3	3	3	3	3	3
CO2	explain basics of bot building	3	3	3	3	3	3
CO3	articulate easy and hard ways of bot building	3	2	3	3	3	3
CO4	take part in deploying chatbot on apps	3	2	3	3	3	3
CO5	plan the deployment of chatbot	3	2	3	3	3	3

**MULTIMEDIA AND ANIMATION
(Open Elective - II)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22OE72	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	explain the concepts of multimedia	3	3	3	3	3	3
CO2	outline the concepts of animation	3	3	3	3	3	3
CO3	make use of 2D and 3D animation concepts	3	2	3	3	3	2
CO4	develop motion caption using animation techniques	3	2	3	3	3	2
CO5	build concept development using animation techniques	3	2	3	3	3	2

**EMBEDDED SYSTEMS
(Open Elective-II)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22OE73	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO7	PO12
CO1	analyze the basic concepts of embedded systems	3	2	2	2	3	3
CO2	illustrate typical embedded system	3	2	3	3	3	3
CO3	adapt the knowledge of interfacing in embedded domain	3	3	3	2	3	3
CO4	compile embedded systems programming	3	3	3	2	3	3



CO5	explain the various real time operating system concepts	3	2	3	2	3	3
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NEURAL NETWORKS AND DEEP LEARNING LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CAPC72	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	develop programs for neural networks	3	3	3	3
CO2	implement perceptron learning for linearly separable problem	3	3	3	3
CO3	sketch multiple curve using neural networks programs	3	3	3	3
CO4	use Spyder IDE Environment for Python Programs	3	3	3	3
CO5	apply the Autoencoder algorithms for encoding the real-world data	3	3	3	3

PROFESSIONAL PRACTICE, LAW & ETHICS LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22HS71	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO10	PO12
CO1	identify code of ethics and professional responsibilities	3	3	3	3	3
CO2	illustrate law of contract and legality of object	3	3	3	3	3
CO3	outline salient features of sale of goods act and agency law	3	3	3	3	3
CO4	assess the process for arbitration, adjudication and conciliation	3	3	3	3	3
CO5	apply legal provisions for cyber & environmental protection laws	3	3	3	3	3

PROJECT STAGE - I

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CAPR71	-	-	6	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the real-world complex problems and set of objectives	3
CO2	review relevant literature from various sources	3
CO3	compile data and propose suitable tools and techniques	3
CO4	prepare an abstract of the proposed project	3
CO5	apply core competence to propose economically feasible solutions	3

AUGMENTED AND VIRTUAL REALITY (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CAPE81	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
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CO1	illustrate taxonomy and features of AR systems	2	2	2	2	2	3
CO2	explain fundamentals of virtual reality	3	3	3	3	3	3
CO3	adapt geometric modeling in virtual reality environment	3	3	3	3	3	3
CO4	make use of virtual environment for animation	3	2	3	3	2	3
CO5	develop VR and AR applications	3	3	3	3	3	3

ARTIFICIAL NEURAL SYSTEMS (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CAPE82	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline fundamentals of artificial neural systems	3	2	3	3	3	3
CO2	illustrate classifiers in artificial neural systems	3	2	3	2	3	3
CO3	make use of various layers and networks	3	3	3	3	3	3
CO4	adapt associate memories	3	3	3	3	3	3
CO5	apply Neural Algorithms and Systems in real life applications	3	3	3	3	3	3

NATURE INSPIRED COMPUTING (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CAPE83	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of Nature Inspired Computing	3	3	2	2	3	3
CO2	develop programs using the concepts of Genetic Algorithms	3	3	3	2	3	3
CO3	make use of Swarm Intelligence and immunocomputing	3	3	3	3	3	3
CO4	show self-tuning algorithms	3	2	3	3	3	3
CO5	describe nature inspired computing for artificial life	3	2	2	2	3	3

AI IN HEALTHCARE (Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CAPE84	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline the concepts of AI in healthcare	3	3	2	2	3	3
CO2	explain the potentials of AI in Healthcare	3	2	3	3	3	3
CO3	use timeliness and ethics in AI based healthcare systems	3	2	2	3	3	3
CO4	illustrate future of healthcare in technological perspective	3	2	2	2	3	3
CO5	adapt AI in healthcare management systems	3	3	3	3	3	3



**COGNITIVE COMPUTING
(Professional Elective - VI)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CAPE85	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of cognitive computing	3	3	3	3	3	3
CO2	illustrate complex relationship between systems	3	3	3	3	3	3
CO3	describe the hypothesis and design principle of cognitive system	3	3	3	3	3	3
CO4	show the business implications of cognitive computing	3	3	3	3	3	3
CO5	articulate future applications of cognitive computing	3	2	2	3	3	3

**ARTIFICIAL IMMUNE SYSTEM
(Professional Elective - VI)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CAPE86	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of human immune system	3	2	2	3	3	3
CO2	demonstrate malware detection in context of immunity	3	3	3	3	3	3
CO3	use malware detection approaches and immunity model	3	2	2	3	3	3
CO4	adapt feature-based negative selection algorithm	3	2	2	3	3	3
CO5	illustrate immune concentration-based malware detection	3	3	3	3	3	3

**AI IN ROBOTICS
(Professional Elective - VI)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CAPE87	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the concepts of AI application in robotics	3	3	2	2	3	3
CO2	demonstrate control paradigms of mobile robots	3	3	2	2	3	3
CO3	make use of AI tools and software in robotics	3	3	3	3	3	3
CO4	illustrate swarm robotics	3	3	3	3	3	3
CO5	adapt human robot interaction	3	2	2	3	3	3

**DRONES
(Professional Elective - VI)**

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CAPE88	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
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CO1	explain concepts of creative industries	3	3	3	3	3	3
CO2	outline the needs of creative industries	3	3	3	3	3	3
CO3	illustrate deployment and deadly abilities of drones	3	2	2	3	3	3
CO4	adapt price based data routing in dynamic IoT	3	2	2	3	3	3
CO5	make use of security in UAV/Drone communications	3	2	2	3	3	3

GAME DEVELOPMENT (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22OE81	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO4	PO5	PO8	PO12
CO1	summarize game design concepts	3	3	2	3	2
CO2	explain basics of game & play	3	3	3	3	2
CO3	articulate game mechanics and experiences	3	3	3	3	3
CO4	take part in game structure development	3	3	3	3	3
CO5	plan aesthetics of game development	3	3	3	3	3

PRECISION AGRICULTURE (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22OE82	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO7	PO8	PO12
CO1	explain the concepts of precision agriculture	3	3	3	3	3
CO2	outline the components of precision agriculture	3	3	3	3	3
CO3	illustrate about tools technologies and sampling	3	3	3	3	3
CO4	adapt recent advances in precision agriculture	2	2	3	3	3
CO5	make use of feasibility and evaluation of precision farming	2	2	3	3	3

ELECTRONICS FOR HEALTH CARE (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22OE83	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO6	PO8	PO12
CO1	explain the various methods of recording of biopotentials	3	3	3	3	3
CO2	measure biochemical and various physiological information	2	3	2	3	3
CO3	make use of assist devices and biotelemetry	3	3	3	3	3
CO4	use of radiation for diagnostic and therapy	3	3	3	3	3
CO5	adapt techniques of electrical safety in hospitals	3	3	2	3	3



PROJECT STAGE – II INCLUDING SEMINAR

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CAPR81	-	-	22	11

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	design and develop a prototype/process/simulation for identified problem	3
CO2	execute project using modern tools and prepare the report	3
CO3	exhibit leadership and managerial skills in project development	3
CO4	function effectively as individual and member or leader in project teams	3
CO5	apply engineering knowledge for societal sustenance	3

Academic Regulations (R20)
B.Tech. - Regular Four Year Degree Programme (CSE – DS)
(For batches admitted from the academic year 2020 - 21)
Department of Computer Science and Engineering (DATA SCIENCE)

LINEAR ALGEBRA & CALCULUS

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-101	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	analyze the nature of sequences and series	3	2	1
CO4	verify mean value theorems and evaluate improper integrals by using Beta and Gamma functions	3	2	1
CO5	find the extreme values of functions of two variables	3	2	1

ENGINEERING CHEMISTRY

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-105	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1
CO4	illustrate the various fuels, synthesis of polymers and drugs	3	2	1
CO5	analyze the properties of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-101	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	elaborate the concepts of network theorems & single phase AC circuits	3	3	2	1
CO3	explain three phase AC circuits and P-N Junction Diode	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1

PROBLEM SOLVING WITH C PROGRAMMING

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-103	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
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3/2/20


CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data	3	3	2	2
CO5	implement various file operations in C programming	3	3	2	2

ENGINEERING CHEMISTRY LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-BSC-106	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	determine the hardness in water samples to solve societal problems	3
CO2	estimate the strength of the given solutions	3
CO3	analyze adsorption and viscosity of various fluids	3
CO4	synthesize the various organic compounds used in medical industry	3
CO5	verify and understand the distribution coefficient	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-102	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	design electrical circuits to verify circuit laws	3
CO2	evaluate network theorems	3
CO3	verify the V-I characteristics of various electronic devices	3
CO4	determine the efficiency of various rectifiers	3
CO5	illustrate the configurations of Bi-polar junction transistor	3

PROBLEM SOLVING WITH C PROGRAMMING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-104	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	execute simple programs using C compiler	3
CO2	apply control statements in designing programs	3
CO3	design programs using functions, arrays, strings and pointers	3
CO4	construct programs for heterogeneous data	3
CO5	implement various file operations in C programming	3

IT & ENGINEERING WORKSHOP PRACTICE

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-ESC-108	-	-	3	1.5



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	execute simple programs using Sci Lab	3	3	2	2
CO2	design programs using conditional statements and loops	3	3	2	2
CO3	apply safety norms while handling the workshop equipment	3	1	3	2
CO4	prepare required models using various engineering trades	3	1	3	2
CO5	make use of various power tools	3	1	3	2

NATIONAL SERVICE SCHEME (NSS)/PHYSICAL EDUCATION/YOGA MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-I-Sem.	L	T	P	C
Subject Code	20-MC-101	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO6	PO8	PO9	PO12
CO1	harness physical literacy and lifelong engagement	3	3	3	3	3
CO2	use aesthetic appreciation	2	1	2	3	3
CO3	build competence and confidence to face challenges	1	2	1	3	3
CO4	develop Sports related values and attitudes	3	3	2	2	3
CO5	follow appropriate etiquette and sports	1	1	2	3	3

ADVANCED CALCULUS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-102	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve linear and non-linear ordinary differential equations	3	2	1
CO2	solve linear and non-linear partial differential equations	3	2	1
CO3	evaluate the line, surface and volume integrals and convert them from one to another by using multiple integrals	3	2	1
CO4	determine vector field, scalar field, gradient, divergence and curl by using vector differentiation	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

APPLIED PHYSICS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-103	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the principles of Quantum Mechanics	3	2	1
CO2	analyze various electron theories of conduction in solids	3	2	1
CO3	classify semiconductors and relate functioning of semiconductor devices	3	2	1
CO4	illustrate principles and applications of lasers and optical fibers	3	2	1
CO5	outline dielectric and magnetic properties of materials	3	2	1

ENGLISH FOR ENGINEERS



Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-HSMC-101	2	-	-	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in RAWLS skills	3	1
CO2	demonstrate the acquired language in written and spoken contexts	3	1
CO3	express, restate and respond appropriately by comprehending the given data	3	1
CO4	develop proficiency to succeed in academic activities, research and career	3	1
CO5	excel in professional and social etiquette	3	1

DATA STRUCTURES THROUGH C

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-105	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	classify different data structures to design efficient programs	3	3	2	2
CO2	identify appropriate sorting and searching techniques	3	2	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	explain various concepts of non-linear data structures	3	3	2	2
CO5	choose an appropriate hashing technique for a given problem	3	3	2	2

COMPUTER AIDED ENGINEERING GRAPHICS

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-107	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	2
CO2	construct conic sections using various methods	3	3	2
CO3	draw orthographic projections of points, lines, planes and solids	3	3	2
CO4	draw development of solid surfaces	3	3	2
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	2

APPLIED PHYSICS LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-BSC-104	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	demonstrate the electrical properties of a semiconductor	3
CO2	compare practical results with theoretical calculations in electrical circuits	3
CO3	demonstrate the properties of lasers and optical fibers	3
CO4	find the energy gap of a semiconductor and identify its band structure	3
CO5	examine electrical resonance in LCR circuits	3



ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-HSMC-102	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	identify the nuances of the language through multimedia experience	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3
CO4	develop speaking and listening skills	3	3
CO5	appraise communication and correspond effectively	3	3

DATA STRUCTURES THROUGH C LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-ESC-106	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4
CO1	implement various searching and sorting techniques	3
CO2	demonstrate basic operations of stack and queues using arrays and linked lists	3
CO3	apply stack data structure to solve various computing problems	3
CO4	demonstrate and apply different methods for traversing graphs	3
CO5	construct binary search tree	3

ENVIRONMENTAL SCIENCE MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-II-Sem.	L	T	P	C
Subject Code	20-MC-102	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	identify the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	outline bio-diversity and its relevance to ecological balance	3	3	3	2
CO4	explain laws and legislations on environmental protection	3	3	3	3
CO5	evaluate technologies for achieving sustainable development	3	3	3	2

STATISTICAL FOUNDATIONS FOR COMPUTER SCIENCE

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-BSC-201	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the concepts of probability and random variables	3	2	1
CO2	illustrate the importance of discrete, continuous and sampling distributions	3	2	1
CO3	use various estimation methods and test hypothesis for large samples	3	2	1
CO4	test hypothesis for small samples and find correlation/regression analysis	3	2	1



CO5	apply the theory of stochastic processes to analyze classification of states	3	2	1
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DISCRETE MATHEMATICS & GRAPH THEORY

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-208	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	verify logical statements using connectives	3	3	2
CO2	validate arguments using predicate calculus	3	3	2
CO3	perform various operations with relational algebra	3	3	2
CO4	solve problems using combinatorics	3	3	2
CO5	simplify real-life situations using graph theory	3	3	3

DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-209	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12
CO1	interpret number systems and logical functions using K-Maps	3	3	2	2	2
CO2	design various combinational and sequential circuits	3	3	2	2	3
CO3	illustrate computer components and function of 8086 processor	3	3	2	2	2
CO4	analyze arithmetic operations and I/O operations	3	3	2	2	3
CO5	distinguish various memories and pipelining operations	3	3	2	2	3

DATABASE MANAGEMENT SYSTEMS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CS-PC-211	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design simple databases using basic concepts of database architectures	3	3	3	2
CO2	construct databases using ER Modelling	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	2
CO4	apply normalization on database to eliminate redundancy	3	3	3	2
CO5	illustrate the mechanisms of transaction management, concurrency control and recovery system	3	3	3	2

PYTHON PROGRAMMING

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CS-PC-212	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	perceive the fundamentals of python programming	3	3	2	2
CO2	develop programs using control statements	3	3	2	2



CO3	analyze the programming performances using functions	3	3	2	2
CO4	make use of collections in python programming	3	3	3	2
CO5	design classes and build error-free codes	3	3	3	3

DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-ESC-210	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	design logic gates using NAND and NOR gates	3	3
CO2	construct the combinational and sequential logic circuits	3	3
CO3	solve simple problems using ALP	3	3
CO4	implement string handling operations using ALP	3	3
CO5	develop programs using procedures and macros	3	3

DATABASE MANAGEMENT SYSTEMS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CS-PC-213	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	construct databases using SQL commands	3	3
CO2	apply normalization techniques to eliminate redundancy	3	3
CO3	design a database schema for a given domain	3	3
CO4	solve queries based on joins, nested queries and aggregate functions	3	3
CO5	execute PL / SQL programs for a given application	3	3

PYTHON PROGRAMMING LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-CS-PC-214	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

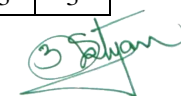
COs	Upon completion of course the students will be able to	PO4	PO5
CO1	write simple programs using python	3	3
CO2	develop programs using control statements	3	3
CO3	implement functions and file I/O operations	3	3
CO4	make use of lists and tuples in python	3	3
CO5	design simple GUI programs	3	3

BUSINESS COMMUNICATION SKILLS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-HSMC-201	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3



CO3	make use of soft skills to become a professional team member	3	3
CO4	apply knowledge of decision making, leadership, motivation	3	3
CO5	exhibit confidence in facing the interview process	3	3

GENDER SENSITIZATION LAB (MANDATORY COURSE- NON- CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	20-MC-201	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

AUTOMATA AND COMPILER DESIGN

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-221	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design various finite automata	3	3	3	2
CO2	write a context free grammar for a given language	3	3	3	2
CO3	construct various parsers, semantics and intermediate code forms	3	3	3	2
CO4	implement code optimization techniques	3	3	3	2
CO5	apply generic code generation algorithm to generate target code	3	3	3	2

DESIGN & ANALYSIS OF ALGORITHMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-222	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	measure time and space complexity of algorithms	3	3	3	3
CO2	solve problems using disjoint sets and divide-and-conquer techniques	3	3	2	2
CO3	apply greedy method and dynamic programming paradigm to solve the problems	3	3	2	2
CO4	adapt back-tracking and branch-bound methods to solve problems	3	3	2	2
CO5	interpret NP-hard and NP-complete problems	3	3	2	2

OOP THROUGH JAVA

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-223	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
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CO1	write simple java programs using OOP concepts	3	3	2	2
CO2	interpret programs using the concepts of inheritance, polymorphism, packages and interfaces	3	3	2	2
CO3	build efficient and error free codes using the concepts of multithreading and exception handling	3	3	3	3
CO4	design GUI programs using the concepts of AWT and event handling	3	3	3	2
CO5	develop real-time applications using applets and swings	3	3	3	3

COMPUTER NETWORKS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-224	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	outline the basics of computer networks and various layers	3	3	2	3
CO2	demonstrate multiple access protocols	3	3	2	3
CO3	interpret network layer and routing algorithms	3	3	3	3
CO4	illustrate internetworking and various transport protocols	3	3	3	3
CO5	make use of various protocols of application layer	3	3	2	3

OPERATING SYSTEMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-225	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	outline various concepts operating systems and Linux utilities	3	3	2
CO2	solve synchronization problems by using process management and API s	3	3	2
CO3	adapt various deadlock handling and memory management mechanism	3	3	2
CO4	analyze various file management system	3	3	2
CO5	make use of I/O Management and security mechanisms	3	3	2

OOP THROUGH JAVA LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-226	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5
CO1	write, compile and execute simple java programs	3	3
CO2	develop programs using inheritance, polymorphism, packages and Interfaces	3	3
CO3	demonstrate multithreading and exception handling mechanisms	3	3
CO4	design GUI using the concepts of AWT and event handling	3	3
CO5	build real-time applications using applets and swings	3	3

OPERATING SYSTEMS (LINUX) LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-CS-PC-227	-	-	3	1.5



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO5	PSO2
CO1	illustrate Linux shell environment	3	3	3
CO2	create process using APIs	3	3	3
CO3	interpret various CPU scheduling algorithms and file allocation methods	3	3	3
CO4	experiment with page replacement and memory management	3	3	3
CO5	distinguish deadlock avoidance and deadlock prevention	3	3	3

APTITUDE AND CRITICAL THINKING SKILLS LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-204	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	build proficiency in quantitative reasoning	3	3
CO2	improve critical thinking skills	3	3
CO3	enhance analytical skills	3	3
CO4	demonstrate quantitative aptitude concepts	3	3
CO5	adapt principles of quantitative aptitude to achieve qualitative results	3	3

SOCIAL INNOVATION LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-BSC-205	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	illustrate social innovation	3
CO2	identify the problems	3
CO3	choose suitable design processes	3
CO4	develop a prototype using suitable platform	3
CO5	prepare a report using project management techniques and ethics	3

INDIAN CULTURE AND CONSTITUTION MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	20-MC-202	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	1
CO2	explain features of languages, religions and holy books	3	2
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	2

SOFTWARE DESIGN AND ENGINEERING

Course	B.Tech.-V-Sem.	L	T	P	C
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Subject Code	20-CS-PC-311	3	-	-	3
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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO11	PO12	PSO1
CO1	identify & analyze software requirements and prepare SRS	3	3	3	3	3	3
CO2	design a system, component or process to meet the needs	3	3	3	3	3	3
CO3	make use of UML diagrams in software design	3	3	3	3	3	3
CO4	analyze various testing techniques by using various metrics	3	3	3	3	3	3
CO5	adapt risk management strategies to assure software quality	3	2	3	3	3	3

DATA MINING AND DATA ANALYTICS

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-312	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	summarize fundamentals of data mining	3	2	2	2	2
CO2	illustrate various mining association rules	3	3	2	2	3
CO3	make use of classification and clustering techniques	3	3	3	2	3
CO4	outline various data analytics techniques	3	2	2	2	3
CO5	solve statistical problems using R programming	3	3	3	3	3

INFORMATION AND CYBER SECURITY

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-313	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain information and cyber security terminologies	2	2	2	3	2	3
CO2	identify various cyber offences	3	3	3	3	3	3
CO3	apply cryptography for security networks	3	3	3	3	3	3
CO4	use standards and cyber laws to enhance cyber security	3	3	3	3	3	3
CO5	illustrate the importance of security policies & IT Act	3	3	3	3	3	3

ARTIFICIAL INTELLIGENCE

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-314	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12	PSO1
CO1	explain the concepts of artificial intelligence	3	3	3	3	2	3
CO2	illustrate various search algorithms	3	3	3	3	2	3
CO3	adapt various probabilistic reasoning approaches	3	3	2	3	3	3
CO4	elaborate Markov decision process	3	3	2	3	2	3
CO5	perceive various reinforcement learning approaches	3	3	2	3	3	3



SOFT COMPUTING (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PE-311	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	use search techniques in AI problems	3	2	2	2	2	3
CO2	describe various supervise learning techniques	3	2	3	3	2	3
CO3	apply special networks in soft computing problems	3	3	3	3	3	3
CO4	implement fuzzy systems in engineering applications	3	2	3	3	3	3
CO5	perform various operations of genetic algorithms	3	3	3	3	3	3

GAMIFICATION (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PE-312	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12	PSO1
CO1	outline the importance of Gamification	3	2	2	3	3	2	3
CO2	make use of game elements	3	3	3	3	3	2	3
CO3	adapt theories of Gamification	3	3	3	3	3	3	3
CO4	apply Gamification to various learning domains	3	3	3	2	3	3	3
CO5	interpret Alternate Reality Games for Corporate Learning	3	2	3	3	3	3	3

DIGITAL MARKETING (Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PE-313	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	outline the importance of digital marketing	2	1	2	3	3	3
CO2	use search engine optimization to achieve business goals	3	2	3	3	3	3
CO3	adapt social media for business promotion	3	3	3	3	3	3
CO4	identify link building techniques for content consideration	3	2	3	3	3	3
CO5	apply digital marketing techniques in real time applications	3	3	3	3	3	3

INFORMATION AND CYBER SECURITY LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-316	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
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CO1	explain concepts of cryptanalysis	3	3	3
CO2	Examine different vulnerability attacks	3	3	3
CO3	illustrate Wi-Fi security techniques	3	3	3
CO4	Able to do malware analysis.	3	3	3
CO5	Able to configure simple firewall and IT audit	3	3	3

ARTIFICIAL INTELLIGENCE LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-317	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	illustrate various search techniques	3	3	3
CO2	solve real-time problems using graph theory	3	3	3
CO3	develop various games using AI techniques	3	3	3
CO4	adapt Bayesian probability model	3	3	3
CO5	design programs based on Markov decision process	3	3	3

AUTOMATED TESTING TOOLS (SELENIUM) LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PC-318	1	-	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO8	PSO2
CO1	install JAVA, Associate SWD Jars and Browser drivers	3	2	2	3	3	3
CO2	devise website issues using automation	3	3	3	3	3	3
CO3	develop programs using web drivers	3	3	3	3	3	3
CO4	design test cases for validation of data	3	2	2	3	3	3
CO5	plan automation to address real time problems	3	3	3	3	3	3

SUMMER INTERNSHIP

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-CS-PR-311	-	-	-	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	utilize the domain knowledge with modern tools to solve real world problems	3
CO2	analyze the industrial processes that results in the end product / service	3
CO3	extend global needs for professional ethics, responsibility and communication	3
CO4	function well as an individual, member or leader in diverse teams	3
CO5	make use of engineering knowledge for societal sustenance	3

CODING SKILLS MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	20-MC-301	1	-	2	-



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO4	PO5	PO12
CO1	solve real world problems using C & DS	3	3	3	3	3
CO2	solve real world problems using DBMS	3	3	3	3	3
CO3	solve real world problems using Python	3	3	3	3	3
CO4	solve real world problems using Java, HTML, JavaScript	3	3	3	3	3
CO5	solve real world problems using any one emerging technology	3	3	3	3	3

IOT WITH CLOUD COMPUTING

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO12	PSO1
CO1	explain the concepts of IoT	3	2	3	3	3	3
CO2	illustrate the foundations of IoT	3	2	3	3	3	3
CO3	adapt protocol and standards of IoT	3	3	3	3	3	3
CO4	outline the importance of cloud in IoT	3	3	3	3	3	3
CO5	make use of cloud in IoT enabled spaces	3	2	3	3	3	3

MACHINE LEARNING AND DATA SCIENCE

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	demonstrate the required mathematical foundations for ML& DS	3	3	3	3	3
CO2	outline the functionalities of machine learning	3	3	3	3	3
CO3	illustrate learning algorithms & data science basics	3	3	2	2	3
CO4	build data science applications using Python based toolkits	3	3	3	3	3
CO5	use recommender systems and sentiment analysis in real time applications	3	3	3	3	3

FULL STACK WEB DEVELOPMENT

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	explain the concepts of full stack web development	3	2	2	3	3
CO2	illustrate High level programming and jQuery concepts	3	2	2	3	3
CO3	make use of Node.js and MongoDB Driver for web development	3	3	3	3	3
CO4	develop app using angularJS concepts	3	3	3	3	3
CO5	establish version control in GitHub	3	2	3	3	3



COMPUTER VISION (Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PE-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of geometric camera models	3	2	2	3	2	3
CO2	demonstrate light and shading	3	3	3	3	3	3
CO3	illustrate the concepts of colour in computer vision	3	3	2	3	2	3
CO4	make use of linear filters	3	3	2	3	2	3
CO5	adapt local image features	3	2	2	3	2	3

BLOCKCHAIN AND CRYPTOCURRENCY (Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PE-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the fundamentals of Blockchain techniques	3	2	2	3	3	3
CO2	analyze various consensus problems	3	3	3	3	2	3
CO3	adapt Blockchain technology to improve business	3	3	3	3	2	3
CO4	make use of Ethereum frameworks to write smart contract	3	3	3	3	2	3
CO5	interpret Blockchain technology in real time applications	3	3	3	3	2	3

AUGMENTED AND VIRTUAL REALITY (Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PE-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	illustrate taxonomy and features of AR systems	2	2	2	2	2	3
CO2	explain fundamentals of virtual reality	3	3	3	3	3	3
CO3	adapt geometric modeling in virtual reality environment	3	3	3	3	3	3
CO4	make use of virtual environment for animation	3	2	3	3	2	3
CO5	develop VR and AR applications	3	3	3	3	3	3

DISASTER MANAGEMENT (Open Elective - I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-321	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO7	PO8	PO12
CO1	analyze impact of disasters	3	2	3	3
CO2	choose suitable disaster management mechanism	3	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	2	2	3	2
CO4	develop strategies to cope up with disasters	3	3	3	3
CO5	build disaster management plan	2	3	3	3

ROBOTICS (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-322	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO12
CO1	illustrate principles and functioning of the robot	3	2	2	2
CO2	perform kinematic analysis for end-effector positioning	3	3	3	2
CO3	integrate sensors for robot	3	3	3	2
CO4	design control laws for a robot	3	3	2	2
CO5	develop robot programming for various applications	3	3	3	2

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-323	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	apply the fundamental concepts of measuring instruments	3	2	2
CO2	distinguish signal generators and signal analyzers	3	3	2
CO3	make use of oscilloscopes	3	2	2
CO4	identify various transducers	3	3	2
CO5	develop bridges for various measuring parameters	3	2	2

JAVA PROGRAMMING (Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-OEC-324	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	write simple java programs using OOP concepts	3	2	2	3	2
CO2	develop programs using inheritance and polymorphism	3	2	3	3	2
CO3	create packages and interfaces	3	2	3	3	2
CO4	build efficient code using multithreading and exception handling	3	2	3	3	2
CO5	design real-time applications using applets	3	2	3	3	2



IOT WITH CLOUD COMPUTING LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-324	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	identify various IoT devices	3	3	3
CO2	use IoT devices in various applications	3	3	3
CO3	develop automation work-flow in IoT enabled cloud environment	3	3	3
CO4	take part in practicing and monitoring remotely	3	3	3
CO5	make use of various IoT protocols in cloud	3	3	3

MACHINE LEARNING AND DATA SCIENCE LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-325	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	illustrate the implementation procedures for the ML algorithms	3	3	3
CO2	demonstrate the ID3 classification algorithms	3	3	3
CO3	analyze k-Means clustering on different datasets	3	3	3
CO4	apply predictive algorithms on live data	3	3	3
CO5	identify the regression algorithms to solve real world problems	3	3	3

FULL STACK WEB DEVELOPMENT LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-CS-PC-326	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	illustrate implementation procedure of full stack web development	3	3	3
CO2	demonstrate HTML5, CSS5 scripting languages and Github	3	3	3
CO3	make use of scripting languages in web development	3	3	3
CO4	develop web applications using AJAX	3	3	3
CO5	build real time applications using full stack web development	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-HSMC-301	1	-	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO10
CO1	assess and utilize vocabulary in an effective way	3	3
CO2	interpret interpersonal relationships	3	3
CO3	elaborate academic reading and writing skills	3	3



CO4	formulate appropriate communication techniques in various contexts	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3

HUMAN VALUES AND PROFESSIONAL ETHICS MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	20-MC-302	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO12
CO1	identify values and ethics and its relation to individual excellence	3	3	3	2
CO2	outline the ten commandments and try to apply in professional career	2	2	3	2
CO3	illustrate modern percepts of ethics, CSR and Corporate Governance	3	3	3	2
CO4	analyze the purpose of professional code of ethics and whistle blowing	3	3	3	2
CO5	practice student professional/technical societies/associations activities	3	3	3	3

BUSINESS ECONOMICS

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-HSMC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	outline the concepts of business management & economics	3	2
CO2	identify demand function to predict sales using linear regression	3	2
CO3	adapt production, price, market and cost analysis functions	3	2
CO4	estimate enterprise requirements under risky economic environment	2	3
CO5	assess the operational and financial performance of an enterprise	3	3

GO PROGRAMMING

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	illustrate the concepts of Go programming	2	3	2	3	3
CO2	demonstrate the variables of Go programming	2	2	2	3	3
CO3	outline functions and packages of Go programming	3	3	3	2	2
CO4	interpret servers of Go programming	3	3	3	3	3
CO5	make use of servers and concurrency in Go programming	3	3	3	2	3

DATA VISUALIZATION TECHNIQUES (Professional Elective - III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CD-PE-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
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CO1	outline the concepts of data visualization	2	3	2	3	3	3
CO2	illustrate time series analysis and mapping	3	3	2	3	3	3
CO3	make use of data processing techniques	3	3	3	3	3	3
CO4	adapt data acquiring tools for processing	3	3	3	3	3	3
CO5	implement data parsing tools and techniques	3	3	3	3	3	3

ROBOTIC PROCESS AUTOMATION (Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CD-PE-412	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline the basics of RPA	3	3	2	3	3	3
CO2	implement RPA	3	3	3	3	3	3
CO3	demonstrate RPA tools and automation techniques	2	2	2	3	3	3
CO4	adapt RPA BOT Models	3	3	3	3	3	3
CO5	execute Orchestrator	3	3	3	3	3	3

WEB AND SOCIAL MEDIA ANALYTICS (Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CD-PE-413	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	illustrate the basics of web and social media data	3	2	2	3	3	3
CO2	explain the value of online data	3	3	2	3	3	3
CO3	adapt collaboration in data and business	3	3	3	3	3	3
CO4	make use of business data for prediction	3	3	3	3	3	3
CO5	outline the importance of system and data	3	3	2	3	3	3

DATA OPTIMIZATION TECHNIQUES (Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CD-PE-414	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of optimization techniques	3	3	2	3	3	3
CO2	illustrate algorithms and complexity	3	3	2	3	3	3
CO3	demonstrate optimization techniques and algorithms	3	3	3	3	3	3
CO4	adapt optimization techniques approximation methods	3	3	3	3	3	3
CO5	make use of linear programming and evolutionary algorithms	3	3	3	3	3	3

QUANTUM COMPUTING (Professional Elective – IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
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Subject Code	20-CD-PE-415	3	-	-	3
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Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the concepts of quantum computing	3	2	2	2	2	3
CO2	use mathematical foundations for quantum computing	3	3	3	2	2	3
CO3	outline the architecture and programming models	3	2	2	2	3	3
CO4	utilize basic techniques of quantum computing	3	3	3	3	2	3
CO5	elaborate major algorithms and discuss about OSS toolkits	3	3	3	3	3	3

**SOFTWARE PROCESS & PROJECT MANAGEMENT
(Professional Elective - IV)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CA-PE-416	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain the concepts of Software process improvement	3	3	2	3	3	3
CO2	illustrate assessment phases and principles	3	3	3	3	3	3
CO3	adapt and establish software configuration management	2	2	2	3	3	3
CO4	use lifecycle phases in project maintenance	3	3	3	3	3	3
CO5	establish iterative process planning & automation	3	3	3	3	3	3

**GREEN BUILDING TECHNOLOGIES
(Open Elective-II)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-411	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO7	PO12
CO1	explain the fundamentals of energy use and processes in building	3	2	2	2
CO2	identify indoor environmental requirement and its management	3	3	3	2
CO3	assess the impact of solar radiation on buildings	3	3	3	2
CO4	evaluate end-use energy utilization and requirements	3	3	2	2
CO5	adapt audit procedures for energy management	3	3	3	2

**DRONES
(Open Elective-II)**

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-412	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO7	PO12
CO1	explain concepts of creative industries	3	3	3	3	3	3
CO2	outline the needs of creative industries	3	3	3	3	3	3
CO3	illustrate deployment and deadly abilities of drones	3	3	3	3	3	3
CO4	adapt price based data routing in dynamic IoT	3	3	3	3	3	3



CO5	make use of security in UAV/Drone communications	3	3	3	3	3	3
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5G TECHNOLOGIES (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-413	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain basic principles of 5G communication	3	3	2	2	3	3	3
CO2	identify the 5G new radio, core network, mobile networks	3	3	2	2	3	3	3
CO3	analyze the physical architecture of 5G and its challenges	3	3	2	2	3	3	3
CO4	design the modulation and multiple access technique for 5G	3	3	2	2	3	3	3
CO5	evaluate the various channels, layers and links used in 5G	3	3	2	2	3	3	3

DATABASE MANAGEMENT SYSTEMS (Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-OEC-414	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO5	PO12
CO1	design databases using E-R model	3	3	3	3	2
CO2	construct database using relational model	3	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	3	2
CO4	make use of transaction control commands	3	3	3	3	2
CO5	apply normalization on database to eliminate redundancy	3	3	3	3	2

GO PROGRAMMING LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CS-PC-412	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PSO2
CO1	write simple programs using Go programming concepts	3	3	3
CO2	articulate the variables of Go programming	3	3	3
CO3	make use of functions and packages of Go programming	3	3	3
CO4	pivot servers of Go programming	3	3	3
CO5	prioritize servers and concurrency in Go programming	3	3	3

INDUSTRY ORIENTED MINI-PROJECT

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CA-PR-411	-	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the problem statement, assess the scope and develop a prototype	3



CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3

PREDICTIVE ANALYTICS (Professional Elective –V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CD-PE-421	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of predictive analytics	3	2	2	2	3	3
CO2	demonstrate malware detection in context of immunity	3	3	3	3	3	3
CO3	make use of modelling toolkits and software solutions	3	3	3	3	3	3
CO4	demonstrate IBM Watson computer	3	2	3	3	3	3
CO5	illustrate use of persuasion in prediction	3	2	3	3	3	3

DATA STREAMING TECHNIQUES (Professional Elective – V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CD-PE-422	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of data streaming	3	2	2	2	2	3
CO2	demonstrate about stream processing applications	3	3	2	3	3	3
CO3	make use of data handling and transportation	3	3	3	3	3	3
CO4	illustrate data analysis algorithms	3	3	3	3	3	3
CO5	adapt message queuing tier in business problems	3	3	3	2	2	3

HEALTHCARE DATA ANALYTICS (Professional Elective – V)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	20-CD-PE-423	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of data sources and basic analytics	3	2	2	3	3	3
CO2	demonstrate about data applications and systems	3	3	3	3	3	3
CO3	illustrate the components and systems of EHR	3	3	3	3	3	3
CO4	adapt biomedical image analysis	3	2	3	3	3	3
CO5	make use of image segmentation and registration	3	2	3	3	3	3



MINING MASSIVE DATASETS (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CD-PE-424	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of dataset mining	3	2	2	3	3	3
CO2	use mapreduce for large scale file systems	3	3	3	3	3	3
CO3	select similar items of a large dataset	3	3	2	3	3	3
CO4	make use of web advertising	3	3	3	3	3	3
CO5	sketch social network graphs for mining	3	2	2	3	3	3

INFORMATION STORAGE AND RETRIEVAL (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CD-PE-425	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline the importance of Information storage and Retrieval	3	3	3	3	3	3
CO2	illustrate cataloging and indexing in information storage	3	2	3	3	3	3
CO3	adapt automatic indexing and clustering in information storage	3	3	3	3	3	3
CO4	implement user search techniques	3	3	3	3	3	3
CO5	apply text search algorithm in information retrieval	3	2	2	3	3	3

TIME SERIES ANALYSIS AND FORECASTING (Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CD-PE-426	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of time series analysis and forecasting	3	3	3	2	3	3
CO2	adapt statistics and forecasting techniques	3	3	3	3	3	3
CO3	illustrate the methods of regression analysis and forecasting	3	3	3	2	3	3
CO4	make use of exponential smoothing methods	3	3	3	3	3	3
CO5	demonstrate transfer functions and intervention models	3	2	2	3	3	3

INTELLECTUAL PROPERTY RIGHTS (Open Elective-III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-421	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO8	PO12
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CO1	outline basics of intellectual property law	3	3	3	3
CO2	identify the various trademarks	3	3	3	3
CO3	analyze patent and copy rights law	3	3	3	3
CO4	differentiate trade secret and unfair practice	3	2	3	2
CO5	summarize new developments in Intellectual Property Rights	3	3	3	3

PRINCIPLES OF ENTREPRENEURSHIP (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-422	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO7	PO8	PO9	PO11	PO12
CO1	illustrate concept & types of entrepreneurship	3	3	2	3	2
CO2	distinguish individual and corporate entrepreneurship	3	3	3	3	2
CO3	identify the process of launching new ventures	3	3	3	3	3
CO4	assess legal challenges of entrepreneurship	3	3	3	3	3
CO5	build entrepreneurial strategies	3	3	3	3	3

PRECISION AGRICULTURE (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-423	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO2
CO1	explain the concepts of precision agriculture	3	3	3	3	3	3
CO2	outline the components of precision agriculture	3	3	3	3	3	3
CO3	illustrate about tools technologies and sampling	3	3	3	3	3	3
CO4	adapt recent advances in precision agriculture	3	3	3	3	3	3
CO5	make use of feasibility and evaluation of precision farming	3	3	3	3	3	3

WEB TECHNOLOGIES (Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-OEC-424	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12
CO1	design web pages using HTML and JavaScript	3	3	3	3	3
CO2	develop web applications using PHP	3	3	3	2	3
CO3	make use of XML and DTD for web design	3	3	3	2	2
CO4	build web applications using servlets and session tracking	3	3	3	2	2
CO5	establish database connectivity using JSP and JDBC	3	3	3	2	2



MAJOR PROJECT

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	20-CA-PR-421	-	-	20	10

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the problem statement, assess the scope and develop a prototype	3
CO2	execute the project using modern tools and prepare the report	3
CO3	demonstrate leadership, management skills for project development with ethics	3
CO4	function effectively as individual / member / leader in project teams	3
CO5	make use of engineering knowledge for societal sustenance	3

DEPARTMENT OF CSE (DATA SCIENCE)(R22)

MATRICES AND CALCULUS

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22BS11	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	solve system of linear equations by using matrices	3	2	1
CO2	find Eigen values and Eigen vectors	3	2	1
CO3	verify mean value theorems and evaluate improper integrals	3	2	1
CO4	find the extreme values of functions of several variables	3	2	1
CO5	evaluate multiple integrals and apply them to find areas and volumes	3	2	1

ENGINEERING CHEMISTRY

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22BS14	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	determine the hardness of water and various treatment methods	3	2	1
CO2	apply the concepts of electrochemistry and corrosion control	3	2	1
CO3	explain the principles of spectroscopy and its applications	3	2	1
CO4	illustrate the various fuels, synthesis of polymers	3	2	1
CO5	analyze and understand the properties, applications of engineering materials	3	2	1

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22ES11	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	solve electrical circuits using circuit laws	3	3	2	1
CO2	elaborate the concepts of network theorems & single phase AC circuits	3	3	2	1
CO3	explain three phase AC circuits and P-N Junction Diode	3	3	2	1
CO4	evaluate the functioning of electronic devices and their applications	3	3	2	1
CO5	illustrate the configurations and biasing techniques of BJT	3	3	2	1



PROGRAMMING FOR PROBLEM SOLVING

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22ES12	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple programs using C language	3	3	2	2
CO2	design structured programs using functions	3	3	2	2
CO3	develop programs using arrays, strings and pointers	3	3	2	2
CO4	construct programs for heterogeneous data and file handling	3	3	2	2
CO5	implement various searching and sorting techniques in C programming	3	3	2	2

ELEMENTS OF COMPUTER SCIENCE & ENGINEERING

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22ES13	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PO9	PO12
CO1	explain the functions of a basic computer and PL	3	3	3	3	3	3	3
CO2	describe the need of OS, database systems and SE	3	3	3	3	3	3	3
CO3	illustrate networks, internet, WWW and security	3	3	3	3	3	3	3
CO4	outline the concepts of AI & ML	3	3	3	3	3	3	3
CO5	demonstrate concepts of DS and autonomous systems	3	3	3	3	3	3	3

ENGINEERING CHEMISTRY LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22BS15	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO9
CO1	determine the hardness in water samples to solve societal problems	3	3
CO2	estimate the strength of the given solutions	3	3
CO3	determine surface tension, Acid value and viscosity of various fluids	3	3
CO4	analyze the rate of corrosion of mild steel in various conditions	3	3
CO5	verify and understand the distribution coefficient	3	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22ES15	-	-	3	1.5



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO9
CO1	design electrical circuits to verify circuit laws	3	3
CO2	evaluate network theorems	3	3
CO3	verify the V-I characteristics of various electronic devices	3	3
CO4	determine the efficiency of various rectifiers	3	3
CO5	illustrate the configurations of Bi-polar junction transistor	3	3

PROGRAMMING FOR PROBLEM SOLVING LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22ES16	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	execute simple programs using C compiler	3	3	3
CO2	apply control statements in designing programs	3	3	3
CO3	design programs using functions, arrays, strings and pointers	3	3	3
CO4	construct programs for heterogeneous data and file operations	3	3	3
CO5	implement various searching and sorting techniques in C programming	3	3	3

COMPUTER AIDED ENGINEERING GRAPHICS LAB

Course	B.Tech.-I-Sem.	L	T	P	C
Course Code	22ES17	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	apply engineering drawing concepts in technical graphic communication	3	3	3	3
CO2	construct conic sections using various methods	3	3	3	3
CO3	draw orthographic projections of points, lines, planes and solids	3	3	3	3
CO4	draw development of solid surfaces	3	3	3	3
CO5	draw the conversions of orthographic to isometric projections & vice versa	3	3	3	3

ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22BS21	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	identify whether the given differential equation of first order is exact or not	3	2	1



CO2	solve ordinary differential equations of higher order	3	2	1
CO3	use the Laplace transforms techniques for solving ODE's	3	2	1
CO4	find vector differentiation of vector & scalar field/gradient/divergence/curl	3	2	1
CO5	solve the line, surface and volume integrals by using vector integration	3	2	1

APPLIED PHYSICS

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22BS22	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the principles of Quantum Physics and band theory of solids	3	2	1
CO2	classify semiconductors and relate functioning of semiconductor devices	3	2	1
CO3	outline the concepts of dielectric, magnetic and energy materials	3	2	1
CO4	use fabrication and characterization techniques of nano-materials	3	2	1
CO5	illustrate principles and applications of lasers and optical fibers	3	2	1

ENGLISH FOR SKILL ENHANCEMENT

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22HS21	2	-	-	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO10	PO12
CO1	acquire proficiency in LSRW skills	3	2
CO2	demonstrate the acquired language in written and spoken contexts	3	2
CO3	express, restate and respond appropriately by comprehending the given data	3	2
CO4	develop proficiency to succeed in academic activities, research and career	3	2
CO5	excel in professional and social etiquette	3	2

DATA STRUCTURES THROUGH PYTHON

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22ES22	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	explain the fundamentals of python programming	3	3	2	2
CO2	develop programs using collections, classes and build error-free codes	3	3	2	2
CO3	illustrate operations and applications of linear data structures	3	3	2	2
CO4	make use of various concepts of non-linear data structures	3	3	3	2
CO5	design data structures using graphs	3	3	3	3



APPLIED PHYSICS LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22BS23	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO9
CO1	calculate the Planck's constant, Hall co-efficient and Energy gap of semiconductors	3	3
CO2	examine the working of semiconductor and optoelectronic devices	3	3
CO3	demonstrate the behavior of magnetic and dielectric materials	3	3
CO4	demonstrate the properties of laser and optical fiber	3	3
CO5	compare practical results with theoretical calculations in electrical circuits	3	3

ENGLISH LANGUAGE LABORATORY FOR EFFECTIVE COMMUNICATION

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22HS22	-	-	3	1.5

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO9	PO10
CO1	identify the nuances of the language through multimedia experience	3	3	3
CO2	express clearly with right accent, intonation to overcome MTI	3	3	3
CO3	demonstrate formal and informal English in real life scenarios	3	3	3
CO4	develop speaking and listening skills	3	3	3
CO5	appraise communication and correspond effectively	3	3	3

DATA STRUCTURES THROUGH PYTHON LAB

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22ES24	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	write simple programs using python	3	3	3
CO2	develop programs using collections and classes	3	3	3
CO3	construct different linear data structures along with their operations	3	3	3
CO4	implement various search trees	3	3	3
CO5	design programs for traversing graphs	3	3	3



IT WORKSHOP PRACTICE

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22ES26	-	1	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO5	PO9	PO10
CO1	classify hardware components and inter dependencies	3	3	2	2
CO2	install operating systems and MS office	3	3	2	2
CO3	configure IP and trouble shoot network connections	3	3	3	2
CO4	use internet and safeguard computer systems from viruses/worms	3	3	3	2
CO5	prepare documentation/presentation by using office tools	3	3	3	2

DESIGN THINKING FOR INNOVATION AND STARTUPS

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22ES27	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PO12	PSO1	PSO2
CO1	illustrate the design thinking practices for value based innovation	3	3	3
CO2	analyze stakeholder behaviour and empathy in ideation	3	3	3
CO3	develop and test prototype for its scalability	3	3	3
CO4	identify and standardize business process	3	3	3
CO5	prepare a startup pitch	3	3	3

ENVIRONMENTAL SCIENCE & DISASTER MANAGEMENT

MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-II-Sem.	L	T	P	C
Course Code	22MC21	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	explain the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	identify solutions for sustainable development and pollution control	3	3	3	2
CO4	analyze various types of disasters	3	3	3	3
CO5	develop strategies for preparedness measures against disasters	3	3	3	2



STATISTICAL FOUNDATIONS FOR COMPUTER SCIENCE

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22BS31	3	1	-	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	explain the concepts of probability and random variables	3	2	1
CO2	illustrate the importance of discrete, continuous and sampling distributions	3	2	1
CO3	use various estimation methods and test hypothesis for large samples	3	2	1
CO4	test hypothesis for small samples and find correlation/regression analysis	3	2	1
CO5	apply the theory of stochastic processes to analyze classification of states	3	2	1

DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22ES32	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12
CO1	interpret number systems and logical functions using K-Maps	3	3	2	2	2
CO2	design various combinational and sequential circuits	3	3	2	2	3
CO3	illustrate computer components and function of 8086 processor	3	3	2	2	2
CO4	analyze arithmetic operations and I/O operations	3	3	2	2	3
CO5	distinguish various memories and pipelining operations	3	3	2	2	3

SOFTWARE DESIGN AND ENGINEERING

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CDPC31	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO11	PO12	PSO1
CO1	identify & analyze software requirements and prepare SRS	3	3	3	3	3	3
CO2	design a system, component or process to meet the needs	3	3	3	3	3	3
CO3	make use of UML diagrams in software design	3	3	3	3	3	3
CO4	analyze various testing techniques by using various metrics	3	3	3	3	3	3
CO5	adapt risk management strategies to assure software quality	3	2	3	3	3	3



OOP THROUGH JAVA

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CDPC32	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	write simple java programs using OOP concepts	3	3	2	2
CO2	interpret programs using OOP concepts	3	3	2	2
CO3	build efficient codes using multithreading and exception handling	3	3	3	3
CO4	design GUI programs using AWT and event handling	3	3	3	2
CO5	develop real-time applications using applets and swings	3	3	3	3

DATABASE MANAGEMENT SYSTEMS

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CDPC33	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design simple databases using database architectures	3	3	3	2
CO2	construct databases using ER Modelling	3	3	3	2
CO3	formulate SQL queries to interact with database	3	3	3	2
CO4	apply normalization on database to eliminate redundancy	3	3	3	2
CO5	explain transaction processing and concurrency control	3	3	3	2

OOP THROUGH JAVA LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CDPC34	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	write, compile and execute simple java programs	3	3	3
CO2	develop programs using inheritance, polymorphism, packages and Interfaces	3	3	3
CO3	demonstrate multithreading and exception handling mechanisms	3	3	3
CO4	design GUI using the concepts of AWT and event handling	3	3	3
CO5	build real-time applications using applets and swings	3	3	3



DATABASE MANAGEMENT SYSTEMS LAB

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CDPC35	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9
CO1	construct databases using SQL commands	3	3	3
CO2	apply normalization techniques to eliminate redundancy	3	3	3
CO3	design a database schema for a given domain	3	3	3
CO4	solve queries based on joins, nested queries and aggregate functions	3	3	3
CO5	execute PL/SQL programs for a given application	3	3	3

DATA WRANGLING AND VISUALIZATION – PYTHON/R PROGRAMMING/POWER BI

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CDPC36	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO9	PO12	PSO2
CO1	create python shell script for data validation	3	3	3	3	3	3
CO2	demonstrate how to import data into tableau	3	3	3	3	3	3
CO3	apply the tableau concepts of dimensions and measures	3	3	3	3	3	3
CO4	develop programs, map visual layouts and graphical properties	3	3	3	3	3	3
CO5	create a dashboard that links multiple visualizations	3	3	3	3	3	3

APP DEVELOPMENT - ANDROID/FLUTTER/FLASK

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22CDPC37	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO9	PO12	PSO2
CO1	demonstrate android/flutter/flask installation	3	3	3	3	3	3
CO2	develop various applications using android	3	3	3	3	3	3
CO3	design various applications using flutter	3	3	3	3	3	3
CO4	implement various applications using flask	3	3	3	3	3	3
CO5	solve real-world problems using android/flutter/flask	3	3	3	3	3	3



GENDER SENSITIZATION

(MANDATORY COURSE - NON-CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22MC31	-	-	2	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO12
CO1	identify gender issues in contemporary India	2	3
CO2	explain gender roles, spectrum, relationships etc	3	2
CO3	analyze gender issues related to sexual harassment and violence	3	3
CO4	assess gender and human rights	3	3
CO5	adapt to the societal need to end prejudices and achieve gender equality	2	3

EMPLOYABILITY SKILLS – I

MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-III-Sem.	L	T	P	C
Subject Code	22MC32	-	-	3	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	demonstrate verbal and written skills effectively	3	3
CO2	develop professional correspondence skills	3	3
CO3	build proficiency in quantitative reasoning	3	3
CO4	improve critical thinking skills	3	3
CO5	exhibit confidence in facing the interview process	3	3

DISCRETE MATHEMATICS & GRAPH THEORY

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22ES41	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	verify logical statements using connectives	3	3	2
CO2	validate arguments using predicate calculus	3	3	2
CO3	perform various operations with relational algebra	3	3	2
CO4	solve problems using combinatorics	3	3	2
CO5	simplify real-life situations using graph theory	3	3	3



DESIGN AND ANALYSIS OF ALGORITHMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22CDPC41	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO12	PSO1
CO1	measure time and space complexity of algorithms	3	3	3	3
CO2	solve problems using disjoint sets and divide-and-conquer techniques	3	3	2	2
CO3	apply greedy method and dynamic programming paradigm to solve the problems	3	3	2	2
CO4	adapt back-tracking and branch-bound methods to solve problems	3	3	2	2
CO5	interpret NP-hard and NP-complete problems	3	3	2	2

COMPUTER NETWORKS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22CDPC42	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12	PSO1
CO1	outline the basics of computer networks and various layers	3	3	2	3
CO2	demonstrate multiple access protocols	3	3	2	3
CO3	interpret network layer and routing algorithms	3	3	3	3
CO4	illustrate internetworking and various transport protocols	3	3	3	3
CO5	make use of various protocols of application layer	3	3	2	3

OPERATING SYSTEMS

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22CDPC43	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO12
CO1	outline various concepts operating systems and Linux utilities	3	3	2
CO2	solve synchronization problems by using process management and APIs	3	3	2
CO3	adapt various deadlock handling and memory management mechanism	3	3	2
CO4	analyze various file management system	3	3	2
CO5	make use of I/O Management and security mechanisms	3	3	2



FULL STACK DEVELOPMENT

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22CDPC44	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	explain the concepts of HTML5 and version control	3	2	2	3	3
CO2	illustrate java script and jQuery concepts	3	2	2	3	3
CO3	use Node.js and MongoDB Driver for web development	3	3	3	3	3
CO4	develop app using Angular concepts	3	3	3	3	3
CO5	design app using ReactJS concepts	3	2	3	3	3

CN & OS (LINUX) LAB

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22CDPC45	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO5	PO9	PSO2
CO1	implement datalink protocols	3	3	3	3
CO2	find shortest path using routing table	3	3	3	3
CO3	illustrate Linux shell environment	3	3	3	3
CO4	interpret CPU scheduling algorithms and file allocation methods	3	3	3	3
CO5	experiment with page replacement and memory management	3	3	3	3

NODE JS/ANGULAR/REACT JS/DJANGO

Course	B.Tech.-IV-Sem.	L	T	P	C
Course Code	22CDPC46	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PO12	PSO2
CO1	build website with HTML5, CSS, Bootstrap and JavaScript	3	3	3	3	3
CO2	demonstrate JavaScript using NodeJS and MongoDB	3	3	3	3	3
CO3	develop single page application using Angular	3	3	3	3	3
CO4	develop single page application using React JS	3	3	3	3	3
CO5	design web application using Django	3	3	3	3	3



AUTOMATED TESTING TOOLS - SELENIUM

Course	B.Tech.- IV-Sem.	L	T	P	C
Course Code	22CDPC47	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO8	PO9	PO12	PSO2
CO1	install JAVA, Associate SWD Jars and Browser drivers	3	3	3	3	3	3	3
CO2	devise website issues using automation	3	3	3	3	3	3	3
CO3	develop programs using web drivers	3	3	3	3	3	3	3
CO4	design test cases for validation of data	3	3	3	3	3	3	3
CO5	plan automation to address real time problems	3	3	3	3	3	3	3

REAL TIME/SOCIETAL RESEARCH PROJECT

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22CDPR41	-	-	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify relevant problem and design & develop a prototype	3
CO2	execute project using modern tools and prepare the report	3
CO3	exhibit leadership and managerial skills in project development	3
CO4	function effectively as individual, member and/or leader in project teams	3
CO5	apply engineering knowledge for societal sustenance	3

INDIAN CULTURE AND CONSTITUTION

MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22MC41	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO8	PO12
CO1	identify paradigm shift in indian culture	3	1
CO2	explain features of languages, religions and holy books	3	2
CO3	illustrate provisions of Indian constitution	3	3
CO4	appreciate the structure of Indian administration system	3	3
CO5	appraise the role of Election Commission of India	3	2



EMPLOYABILITY SKILLS – II

MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-IV-Sem.	L	T	P	C
Subject Code	22MC42	-	-	3	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO9	PO10
CO1	make use of soft skills to become a professional team member	3	3
CO2	develop professional correspondence skills	3	3
CO3	apply knowledge of decision making, leadership, motivation	3	3
CO4	adapt principles of quantitative aptitude to achieve qualitative results	3	3
CO5	exhibit confidence in facing the interview process	3	3

AUTOMATA AND COMPILER DESIGN

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CDPC51	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12
CO1	design various finite automata	3	3	3	2
CO2	write a context free grammar for a given language	3	3	3	2
CO3	construct various parsers, semantics and intermediate code forms	3	3	3	2
CO4	implement code optimization techniques	3	3	3	2
CO5	apply generic code generation algorithm to generate target code	3	3	3	2

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CDPC52	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO6	PO12	PSO1
CO1	illustrate the concepts of AI and various search algorithms	3	3	3	3	3	3
CO2	adapt knowledge representation and probabilistic reasoning	3	3	3	3	2	3
CO3	explain expert systems and concepts of machine learning	3	3	2	3	3	3
CO4	classify various supervised learning algorithms	3	3	2	3	2	3
CO5	demonstrate the various unsupervised learning algorithms	3	3	2	3	3	3



DATA MINING AND DATA ANALYTICS

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CDPC53	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO12	PSO1
CO1	summarize fundamentals of data mining	3	2	3	3	2
CO2	illustrate various mining association rules	3	3	2	2	3
CO3	make use of classification and clustering techniques	3	3	3	2	3
CO4	outline various data analytics techniques	3	2	2	2	3

INFORMATION AND CYBER SECURITY

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CDPC54	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain information and cyber security terminologies	2	2	2	3	2	3
CO2	apply cryptography for security networks	3	3	3	3	3	3
CO3	identify various cyber offences	3	3	3	3	3	3
CO4	use standards and cyber laws to enhance cyber security	3	3	3	3	3	3
CO5	illustrate the importance of security policies & IT Act	3	3	3	3	3	3

DIGITAL MARKETING

(Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CDPE51	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	outline the importance of digital marketing	2	1	2	3	3	3
CO2	use search engine optimization to achieve business goals	3	2	3	3	3	3
CO3	adapt social media for business promotion	3	3	3	3	3	3
CO4	identify and register a domain	3	2	3	3	3	3
CO5	apply digital marketing techniques in real time applications	3	3	3	3	3	3



DATA WAREHOUSING AND BUSINESS INTELLIGENCE

(Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CDPE52	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the basic concept of data warehouse	3	2	2	2	2	3
CO2	identify issues in the design of data warehouse and BI	3	2	3	3	2	3
CO3	apply BI on business information	3	3	3	3	3	3
CO4	analyze business dimensions	3	2	3	3	3	3
CO5	make use of business intelligence	3	3	3	3	3	3

MIDDLEWARE TECHNOLOGIES

(Professional Elective-I)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CDPE53	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the basic concepts of middleware elements	3	3	3	2	2	2
CO2	develop XML for a data source based website	3	3	3	3	3	2
CO3	make use of ASP.NET to implement database access	3	3	3	3	3	2
CO4	organize application and session states	3	3	3	3	2	2
CO5	demonstrate web services	3	3	3	3	3	2

IMAGE PROCESSING

(Professional Elective - I)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CDPE54	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of image	3	2	2	2	3	3
CO2	illustrate image enhancement techniques	3	3	3	2	3	3
CO3	adapt image restoration to refine an image	3	3	3	3	3	3
CO4	use image processing color enhancement	3	2	2	3	3	3
CO5	demonstrate image segmentation & compression	3	2	2	3	3	3



ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CDPC55	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	illustrate various search techniques	3	3	3	3
CO2	solve real-time problems using graph theory	3	3	3	3
CO3	use techniques of knowledge representation and probabilistic reasoning	3	3	3	3
CO4	design various supervised learning algorithms	3	3	3	3
CO5	implement various unsupervised learning algorithms	3	3	3	3

DATA MINING AND DATA ANALYTICS LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CDPC56	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	make use of open source data mining and analytic tools	3	3	3	3
CO2	examine the interesting insights of Apriori algorithm using WEKA	3	3	3	3
CO3	demonstrate the classification and clustering techniques	3	3	3	3
CO4	analyze the concepts of data analytics and statistical testing methods	3	3	3	3
CO5	compare various kinds of regression techniques	3	3	3	3

INFORMATION AND CYBER SECURITY LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22CDPC57	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	explain concepts of cryptanalysis	3	3	3	3
CO2	Examine different vulnerability attacks	3	3	3	3
CO3	illustrate Wi-Fi security techniques	3	3	3	3
CO4	Able to do malware analysis.	3	3	3	3
CO5	Able to configure simple firewall and IT audit	3	3	3	3



AUTOMATED WRITING TOOLS - ChatGPT

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22CDPC58	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO4	PO5	PO8	PO9	PO12	PSO2
CO1	develop content using ChatGPT	3	3	3	3	3	3	3
CO2	plan data simulation using ChatGPT	3	3	3	3	3	3	3
CO3	sketch images using ChatGPT	3	3	3	3	3	3	3
CO4	take a part in validation of data using ChatGPT	3	3	3	3	3	3	3
CO5	modify research content using ChatGPT	3	3	3	3	3	3	3

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Course	B.Tech.-V-Sem.	L	T	P	C
Subject Code	22HS51	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO5	PO9	PO10
CO1	assess and utilize vocabulary in an effective way	3	3	3
CO2	interpret interpersonal relationships	3	3	3
CO3	elaborate academic reading and writing skills	3	3	3
CO4	formulate appropriate communication techniques in various contexts	3	3	3
CO5	adapt to different work-place and socio-cultural scenarios	3	3	3

ENVIRONMENTAL SCIENCE & DISASTER MANAGEMENT

MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-V-Sem.	L	T	P	C
Course Code	22MC51*	2	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO6	PO7	PO12
CO1	explain the role of ecosystem for livelihood	3	3	3	2
CO2	interpret methods to sustain environmental resources	3	3	3	2
CO3	identify solutions for sustainable development and pollution control	3	3	3	2
CO4	analyze various types of disasters	3	3	3	3
CO5	develop strategies for preparedness measures against disasters	3	3	3	2



DATA SCIENCE AND BIG DATA ANALYTICS

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CDPC61	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PSO1
CO1	explain the basics of data science and big data analytics	3	3	3	3	3
CO2	illustrate exploratory data analysis	3	3	3	3	3
CO3	use advanced analytical theory and methods	3	3	2	2	3
CO4	sketch SQL commands for big data	3	3	3	3	3
CO5	describe data visualization	3	3	3	3	3

WEB AND SOCIAL MEDIA ANALYTICS

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CDPC62	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO8	PO12	PSO1
CO1	illustrate the basics of web and social media data	3	2	3	3	3
CO2	explain the value of online data	3	3	3	3	3
CO3	adapt collaboration in data and business	3	3	3	3	3
CO4	make use of business data for prediction	3	3	3	3	3
CO5	outline the importance of system and data	3	3	3	3	3

DEVOPS

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22CDPC63	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	summarize DevOps and continuous delivery concepts	3	3	3	3	3
CO2	explain DevOps architecture	3	3	3	3	3
CO3	articulate source code control in system building	3	2	3	3	3
CO4	take part in server building	3	3	3	3	3
CO5	plan automation and system testing	3	2	3	3	3



IOT AND CLOUD COMPUTING

(Professional Elective -II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CDPE61	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO7	PO12	PSO1
CO1	explain the concepts of IoT	3	2	3	3	3	3	3
CO2	illustrate the foundations of IoT	3	2	3	3	3	3	3
CO3	adapt protocol and standards of IoT	3	3	3	3	3	3	3
CO4	outline the importance of cloud in IoT	3	3	3	3	3	3	3
CO5	make use of cloud in IoT enabled spaces	3	2	3	3	3	3	3

NATURAL LANGUAGE PROCESSING

(Professional Elective -II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CDPE62	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain fundamentals of NLP and morphology	3	2	3	3	3	3
CO2	demonstrate word level statements and syntactic analysis	3	2	3	3	3	3
CO3	make use of context free grammar and parsing techniques	3	3	3	3	3	3
CO4	apply semantic analysis techniques to solve various problems	3	3	3	3	3	3
CO5	illustrate language generation and discourse analysis	3	2	3	3	3	3

ROBOTIC PROCESS AUTOMATION

(Professional Elective - II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CDPE63	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline the basics of RPA	3	3	2	3	3	3
CO2	implement RPA	3	3	3	3	3	3
CO3	demonstrate RPA tools and automation techniques	2	2	2	3	3	3
CO4	adapt RPA BOT Models	3	3	3	3	3	3
CO5	execute Orchestrator	3	3	3	3	3	3



BLOCKCHAIN AND CRYPTOCURRENCY

(Professional Elective -II)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CDPE64	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the fundamentals of Blockchain techniques	3	2	2	3	3	3
CO2	analyze various consensus problems	3	3	3	3	3	3
CO3	adapt Blockchain technology to improve business	3	3	3	3	3	3
CO4	make use of ethereum frameworks to write smart contract	3	3	3	3	3	3
CO5	interpret Blockchain technology in real time applications	3	3	3	3	3	3

E-COMMERCE

(Open Elective - I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22OE61	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO3	PO8	PO9	PO10	PO12
CO1	outline the concepts of E-Commerce	3	2	2	3	3
CO2	develop supporting environment for E-Commerce	3	2	3	3	3
CO3	make use of technology in E-Commerce	3	3	3	3	3
CO4	adapt payment technologies in E-Commerce	3	3	3	3	3
CO5	implement security in E-Commerce	3	3	3	3	3

AGILE METHODOLOGIES

(Open Elective - I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22OE62	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12
CO1	explain the concepts of agile methodology	3	2	3	3	3
CO2	make use of agile process	3	3	3	3	3
CO3	illustrate agility and knowledge management	3	3	3	3	3
CO4	adapt agility and requirements engineering	3	3	3	3	3
CO5	outline the importance agility and quality assurance	3	2	3	3	3



ELECTRONIC SENSORS

(Open Elective-I)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22OE63	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO7	PO8	PO12
CO1	analyze the characterization of sensors	3	3	2	2	3	3
CO2	illustrate thermal embedded system	3	2	3	3	3	3
CO3	adapt magnetic sensors	3	3	3	2	3	3
CO4	make use of radiation sensors	3	3	3	2	3	3
CO5	design a system with sensors	3	2	3	2	3	3

DATA SCIENCE AND BIG DATA ANALYTICS LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CDPC64	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	identify big data and its business Implications	3	3	3	3
CO2	demonstrate Job Execution in Hadoop Environment	3	3	3	3
CO3	develop big data Solutions using Hadoop Ecosystem	3	3	3	3
CO4	use cassandra to perform social media analytics	3	3	3	3
CO5	apply machine learning techniques using R	3	3	3	3

WEB AND SOCIAL MEDIA ANALYTICS LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CDPC65	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	design SEO friendly website	3	3	3	3
CO2	analyze user sentiment based on web traffic and reviews	3	3	3	3
CO3	execute push & pull request in Github	3	3	3	3
CO4	assemble social media widget in any website	3	3	3	3
CO5	develop social media page for any business	3	3	3	3



DEVOPS LAB

Course	B.Tech.-VI-Sem.	L	T	P	C
Course Code	22CDPC66	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	identify DevOps workflow	3	3	3	3
CO2	use eclipse for DevOps	3	3	3	3
CO3	develop docker image	3	3	3	3
CO4	take part in grid deployment	3	3	3	3
CO5	make use of Jenkins framework in DevOps	3	3	3	3

INDUSTRY ORIENTED MINI PROJECT/INTERNSHIP/SKILL ENHANCEMENT COURSE - ETL-KAFKA/TALEND

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CDPR61	-	-	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO1
CO1	apply domain knowledge to solve identified industrial problem	3
CO2	use industrial processes involved in end product/service	3
CO3	exhibit communication skills, professional ethics and social responsibility	3
CO4	manage and lead project in coordination with functional team-members	3
CO5	execute the project that meets industry requirements	3

SKILLS ENHANCEMENT COURSE - ETL-KAFKA/TALEND

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22CDPR61	-	-	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	implement ETL Kafka connection	3
CO2	implement Talend Kafka connection	3
CO3	execute Kafka stream API to setup Kafka ETL	3
CO4	use a Hevo data to setup Kafka	3
CO5	organize Kafka data with Talend	3



ENTREPRENEURSHIP AND IPR
MANDATORY COURSE (NON-CREDIT)

Course	B.Tech.-VI-Sem.	L	T	P	C
Subject Code	22MC61	3	-	-	-

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO7	PO8	PO12
CO1	illustrate entrepreneurship principles	3	3	3	3
CO2	analyze entrepreneurs' mindset	3	3	3	3
CO3	develop Business Plan and incubate innovative ideas	3	3	3	3
CO4	identify entrepreneurs' challenges in light of legal environment	3	2	3	2
CO5	demonstrate various types of IPRs applicable	3	3	3	3

MANAGEMENT, ECONOMICS AND ACCOUNTANCY

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22HS71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO11	PO12
CO1	apply principles of management in professional career	3	2
CO2	make use of principles of economics for decision making	3	2
CO3	solve problems in the areas of production, cost and price	3	2
CO4	prepare balance sheet and maintain books of accounts	2	3
CO5	analyze financial performance of an enterprise	3	3

PREDICTIVE ANALYTICS

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CDPC71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO12	PSO1
CO1	explain the concepts of predictive analytics	3	2	2	3	3
CO2	demonstrate malware detection in context of immunity	3	3	3	3	3
CO3	make use of modelling toolkits and software solutions	3	3	3	3	3
CO4	demonstrate IBM Watson computer	3	2	3	3	3
CO5	illustrate use of persuasion in prediction	3	2	3	3	3



COMPUTER VISION AND ROBOTICS

(Professional Elective -III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CDPE71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of geometric camera models	3	2	2	3	2	3
CO2	demonstrate light and shading	3	3	3	3	2	3
CO3	illustrate the concepts of colour in computer vision	3	3	2	3	2	3
CO4	make use of linear filters and kinematics	3	3	2	3	2	3
CO5	adapt Stereopsis and Robotics	3	2	2	3	2	3

INFORMATION STORAGE AND RETRIEVAL

(Professional Elective - VI)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CDPE72	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	outline the importance of Information storage and Retrieval	3	3	3	3	3	3
CO2	illustrate cataloging and indexing in information storage	3	2	3	3	3	3
CO3	adapt automatic indexing and clustering in information storage	3	3	3	3	3	3
CO4	implement user search techniques	3	3	3	3	3	3
CO5	apply text search algorithm in information retrieval	3	2	2	3	3	3

WEB AND DATABASE SECURITY

(Professional Elective – III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CDPE73	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of web security	3	2	2	3	3	3
CO2	make use of backup technique for data recovery	3	3	3	3	3	3
CO3	implement database security	3	3	3	3	3	3
CO4	classify security Re-engineering for Databases	3	2	2	2	3	3
CO5	demonstrate the need of security and privacy policy	3	2	2	3	3	3



DATA SCIENCE FOR BUSINESS

(Professional Elective - III)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CDPE74	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PO14
CO1	explain the business aspects of data science	3	2	2	2	3	3
CO2	demonstrate business problems with solutions	3	3	3	3	3	3
CO3	make use of predictive modelling and fitting a model in data	3	3	3	3	3	3
CO4	illustrate about visualizing model performance	3	3	3	2	3	3
CO5	adapt other data science tasks and techniques	3	3	3	3	3	3

MINING MASSIVE DATASETS

(Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CDPE75	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of dataset mining	3	2	2	3	3	3
CO2	use mapreduce for large scale file systems	3	3	3	3	3	3
CO3	select similar items of a large dataset	3	3	2	3	3	3
CO4	make use of web advertising	3	3	3	3	3	3
CO5	sketch social network graphs for mining	3	2	2	3	3	3

DATA OPTIMIZATION TECHNIQUES

(Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CDPE76	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of optimization techniques	3	3	2	3	3	3
CO2	illustrate algorithms and complexity	3	3	2	3	3	3
CO3	demonstrate optimization techniques and algorithms	3	3	3	3	3	3
CO4	adapt optimization techniques approximation methods	3	3	3	3	3	3
CO5	make use of linear programming and evolutionary algorithms	3	3	3	3	3	3



QUANTUM COMPUTING

(Professional Elective – IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CDPE77	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the concepts of quantum computing	3	2	2	2	2	3
CO2	use mathematical foundations for quantum computing	3	3	3	2	2	3
CO3	outline the architecture and programming models	3	2	2	2	3	3
CO4	utilize basic techniques of quantum computing	3	3	3	3	2	3
CO5	elaborate major algorithms and discuss about OSS toolkits	3	3	3	3	3	3

SOFTWARE PROCESS & PROJECT MANAGEMENT

(Professional Elective - IV)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CDPE78	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO6	PO8	PO12	PSO1
CO1	explain the concepts of Software process improvement	3	3	2	3	3	3
CO2	illustrate assessment phases and principles	3	3	3	3	3	3
CO3	adapt and establish software configuration management	2	2	2	3	3	3
CO4	use lifecycle phases in project maintenance	3	3	3	3	3	3
CO5	establish iterative process planning & automation	3	3	3	3	3	3

CHATBOTS

(Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22OE71	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO8	PO12
CO1	summarize chatbots and growth of internet	3	3	3	3	3	3
CO2	explain basics of bot building	3	3	3	3	3	3
CO3	articulate easy and hard ways of bot building	3	2	3	3	3	3
CO4	take part in deploying chatbot on apps	3	2	3	3	3	3
CO5	plan the deployment of chatbot	3	2	3	3	3	3



MULTIMEDIA AND ANIMATION

(Open Elective – II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22OE72	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO8	PO12
CO1	explain the concepts of multimedia	3	3	3	3	3	3
CO2	outline the concepts of animation	3	3	3	3	3	3
CO3	make use of 2D and 3D animation concepts	3	2	3	3	3	2
CO4	develop motion caption using animation techniques	3	2	3	3	3	2
CO5	build concept development using animation techniques	3	2	3	3	3	2

EMBEDDED SYSTEMS

(Open Elective-II)

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22OE73	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO7	PO12
CO1	analyze the basic concepts of embedded systems	3	2	2	2	3	3
CO2	illustrate typical embedded system	3	2	3	3	3	3
CO3	adapt the knowledge of interfacing in embedded domain	3	3	3	2	3	3
CO4	compile embedded systems programming	3	3	3	2	3	3
CO5	explain the various real time operating system concepts	3	2	3	2	3	3

PREDICTIVE ANALYTICS LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CDPC72	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO4	PO5	PO9	PSO2
CO1	adapt the concepts of predictive analytics	3	3	3	3
CO2	execute malware detection in context of immunity	3	3	3	3
CO3	make use of modelling toolkits and software solutions	3	3	3	3
CO4	state performance of an individual	3	3	3	3
CO5	recognize use of behaviour in prediction	3	3	3	3



PROFESSIONAL PRACTICE, LAW & ETHICS LAB

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22HS71	-	-	2	1

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO6	PO7	PO8	PO10	PO12
CO1	identify code of ethics and professional responsibilities	3	3	3	3	3
CO2	illustrate law of contract and legality of object	3	3	3	3	3
CO3	outline salient features of sale of goods act and agency law	3	3	3	3	3
CO4	assess the process for arbitration, adjudication and conciliation	3	3	3	3	3
CO5	apply legal provisions for cyber & environmental protection laws	3	3	3	3	3

PROJECT STAGE - I

Course	B.Tech.-VII-Sem.	L	T	P	C
Subject Code	22CDPR71	-	-	6	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	identify the real-world complex problems and set of objectives	3
CO2	review relevant literature from various sources	3
CO3	compile data and propose suitable tools and techniques	3
CO4	prepare an abstract of the proposed project	3
CO5	apply core competence to propose economically feasible solutions	3

AUGMENTED AND VIRTUAL REALITY

(Professional Elective – V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CDPE81	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	illustrate taxonomy and features of AR systems	2	2	2	2	2	3
CO2	explain fundamentals of virtual reality	3	3	3	3	3	3
CO3	adapt geometric modeling in virtual reality environment	3	3	3	3	3	3
CO4	make use of virtual environment for animation	3	2	3	3	2	3
CO5	develop VR and AR applications	3	3	3	3	3	3



DATA STREAMING TECHNIQUES

(Professional Elective – V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CDPE82	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of data streaming	3	2	2	2	2	3
CO2	demonstrate about stream processing applications	3	3	2	3	3	3
CO3	make use of data handling and transportation	3	3	3	3	3	3
CO4	illustrate data analysis algorithms	3	3	3	3	3	3
CO5	adapt message queuing tier in business problems	3	3	3	2	2	3

NATURE INSPIRED COMPUTING

(Professional Elective - V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Course Code	22CDPE83	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO7	PO12	PSO1
CO1	explain the fundamentals of Nature Inspired Computing	3	3	2	2	3	3
CO2	develop programs using the concepts of Genetic Algorithms	3	3	3	2	3	3
CO3	make use of Swarm Intelligence and immunocomputing	3	3	3	3	3	3
CO4	show self-tuning algorithms	3	2	3	3	3	3
CO5	describe nature inspired computing for artificial life	3	2	2	2	3	3

HEALTHCARE DATA ANALYTICS

(Professional Elective – V)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CDPE84	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of data sources and basic analytics	3	2	2	3	3	3
CO2	demonstrate about data applications and systems	3	3	3	3	3	3
CO3	illustrate the components and systems of EHR	3	3	3	3	3	3
CO4	adapt biomedical image analysis	3	2	3	3	3	3



CO5	make use of image segmentation and registration	3	2	3	3	3	3
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VIDEO ANALYTICS

(Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Course Code	22CDPE85	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO8	PO12	PSO1
CO1	explain the basics of video- signals and systems	3	3	2	2	2	3
CO2	Use motion estimation in optimization	3	3	3	3	3	3
CO3	operate video surveillance systems	3	3	3	3	2	3
CO4	identify human activity from a video	3	3	3	3	3	3
CO5	demonstrate GAIT analysis	3	3	2	2	3	3

COMPUTATIONAL BIOLOGY

(Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CDPE86	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO5	PO6	PO12	PSO1
CO1	perceive the history and scope of computational biology	3	3	2	2	2	3
CO2	make use of biological databases and tools	3	3	3	3	3	3
CO3	outline the concepts sequence alignment and NGS	3	3	3	3	2	3
CO4	illustrate predictive methods & protein sequences	3	3	3	3	3	3
CO5	explain drug discovery process	3	3	3	3	3	3

TIME SERIES ANALYSIS AND FORECASTING

(Professional Elective - VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CDPE87	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PSO1
CO1	explain the concepts of time series analysis and forecasting	3	3	3	2	3	3



CO2	adapt statistics and forecasting techniques	3	3	3	3	3	3
CO3	illustrate the methods of regression analysis and forecasting	3	3	3	2	3	3
CO4	make use of exponential smoothing methods	3	3	3	3	3	3
CO5	demonstrate transfer functions and intervention models	3	2	2	3	3	3

PRIVACY PRESERVING IN DATA MINING

(Professional Elective – VI)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CDPE88	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO3	PO5	PO6	PO12	PO13
CO1	outline the concepts of privacy preserving data mining	3	2	2	2	3	3
CO2	make use of group-based anonymization	3	3	3	3	3	3
CO3	adapt distributed privacy for preserving data mining	3	3	3	3	3	3
CO4	demonstrate applications of privacy	3	3	3	3	3	3
CO5	classify inference control methods	3	3	3	3	3	3

GAME DEVELOPMENT

(Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22OE81	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO4	PO5	PO8	PO12
CO1	summarize game design concepts	3	3	2	3	2
CO2	explain basics of game & play	3	3	3	3	2
CO3	articulate game mechanics and experiences	3	3	3	3	3
CO4	take part in game structure development	3	3	3	3	3
CO5	plan aesthetics of game development	3	3	3	3	3

PRECISION AGRICULTURE

(Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22OE82	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO2	PO5	PO7	PO8	PO12
CO1	explain the concepts of precision agriculture	3	3	3	3	3
CO2	outline the components of precision agriculture	3	3	3	3	3
CO3	illustrate about tools technologies and sampling	3	3	3	3	3
CO4	adapt recent advances in precision agriculture	2	2	3	3	3
CO5	make use of feasibility and evaluation of precision farming	2	2	3	3	3

ELECTRONICS FOR HEALTH CARE

(Open Elective – III)

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22OE83	3	-	-	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO2	PO5	PO6	PO8	PO12
CO1	explain the various methods of recording of biopotentials	3	3	3	3	3
CO2	measure biochemical and various physiological information	2	3	2	3	3
CO3	make use of assist devices and biotelemetry	3	3	3	3	3
CO4	use of radiation for diagnostic and therapy	3	3	3	3	3
CO5	adapt techniques of electrical safety in hospitals	3	3	2	3	3

PROJECT STAGE – II INCLUDING SEMINAR

Course	B.Tech.-VIII-Sem.	L	T	P	C
Subject Code	22CDPR81	-	-	22	11

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1 to PSO2
CO1	design and develop a prototype/process/simulation for identified problem	3
CO2	execute project using modern tools and prepare the report	3
CO3	exhibit leadership and managerial skills in project development	3
CO4	function effectively as individual and member or leader in project teams	3
CO5	apply engineering knowledge for societal sustenance	3



18ACADEMICYEAR2017-18(AUTONOMOUS)

CMRINSTITUTE OF TECHNOLOGY							
DEPARTMENT OF MANAGEMENT STUDIES							
COURSE ARTICULATION MATRIX-ACADEMIC YEAR 2017-18-1 YEAR ONLY							
No.	Subject Code	Subject Title	PO-1	PO-2	PO-3	PO-4	PO-5
I-MBA-I-Semester(I-Semester)							
1	17MB1101PC	Management Fundamentals	3.00	1.17	3.00	2.67	2.83
	CO1	Understand Fundamentals of Management and Approaches to management.	3	1	3	3	3
	CO2	The process of planning and its subfunctions.	3	1	3	3	2
	CO3	The process of organizing and its subfunctions.	3	1	3	1	3
	CO4	Process, Principles & techniques of direction.	3	2	3	3	3
	CO5	Process, Principles & techniques of coordination and Controlling	3	1	3	3	3
	CO6	Importance of management and organization in different functional areas.	3	1	3	3	3
2	17MB1102PC	Managerial Economics	3.00	3.00	1.67	3.00	1.67
	CO1	Apply principles of managerial economics to business decision-making.	3	3	2	3	3
	CO2	Forecast demand-supply by assessing impact of different variables.	3	3		3	1
	CO3	Develop a suitable production function for own enterprise and its effect on scale of production.	3	3		3	
	CO4	Determine BEP and employ various applications of BEP for own enterprise.	3	3		3	



	CO5	Set price under different conditions.	3	3	2	3	
	CO6	Determine price & output under different market competitions.	3	3	1	3	1
3	17MB1103PC	Financial Accounting Analysis	3.00	3.00	1.00	3.00	1.00
	CO1	Maintain books of accounts by following accounting principles and standards	3	3	1	3	1
	CO2	Draft Trial Balance, Manufacturing A/c, Trading A/c, Profit & Loss A/c and Balance Sheet.	3	3		3	
	CO3	Analyze financial performance of a business enterprise.	3	3		3	
	CO4	Identify Value of closing stock under FIFO, LIFO and Weighted Average Methods.	3	3		3	
	CO5	Compute good will under Average Profits, Super Profits, Capital Employed in Business.	3	3		3	
	CO6	Prepare Journal & Ledger for shares and debentures.	3	3		3	
4	17MB1104BS	Business Statistics and Research Methodology	3.00	3.00	3.00	3.00	3.00
	CO1	Interpret & draw meaningful inferences using sample and universe.	3	3	3	3	3
	CO2	Present data using tables, charts, diagrams and graphs suitably.	3	3		3	
	CO3	Compute Mean, Median, Mode, SD, Variance, Skewness, and accept or reject the test results.	3	3		3	
	CO4	Compute correlation coefficient and fit a regression line.	3	3		3	
	CO5	Forecast sales level of a business enterprise using Trend Analysis.	3	3		3	
	CO6	Apply suitable parametric & non-parametric tests to test the validity & reliability of test statistic	3	3		3	
5	17MB1105PC	Business & Tax Laws	3.00	2.50	1.00	3.00	1.00
	CO1	Understand and perform contracts, against their remedies for breach of contract.	3	2	1	3	1
	CO2	Understand, follow and practice various provisions & procedures of Indian Companies Act, 1956.	3	2		3	1
	CO3	Determine residential status and compute tax on total taxable income.	3	2		3	
	CO4	Compute Income from Salary & House Property along with deductions and file Individual Return.	3	3		3	
	CO5	Understand and follow the Provisions & Procedures of GST Act.	3	3		3	1
	CO6	Understand role and relevance of Customs & Excise Laws in effect on GST Act.	3	3		3	1
6		Open Elective-1					
	17MB1106OE	Corporate Governance & Ethics	3.00	1.75	3.00	3.00	3.00
	CO1	Follow business ethics and corporate integrity.	3		3	3	3
	CO2	Understand corporate obligations towards stakeholders.	3		3	3	3
	CO3	Reflection of corporate governance on society	3	2	3	3	3
	CO4	Necessity of ethics relevant for decision-making.	3	1	3	3	3
	CO5	Follow best practices in light of societal development.	3	1	3	3	3
	CO6	Employ various theories of corporate governance in reality.	3	3	3	3	3
	17MB1107OE	Rural Marketing	3.00	3.00	3.00	3.00	3.00
	CO1	Identify potential of rural markets and consumer behavior in rural areas.	3	3	3	3	3
	CO2	Understand problems of launching a new or existing product in rural markets	3	3	3	3	3
	CO3	Conduct SWOT in rural areas and changes required in market mix.	3	3	3	3	3
	CO4	Identify & develop product & Promotion mix strategies.	3	3	3	3	3



	CO5	Channel design, selection and training decisions necessary for place mix.	3	3	3	3	3
	CO6	Develop PLC strategies suitable for rural markets.	3	3	3	3	3
	17MB1108OE	Entrepreneurship	3.00	2.00	3.00	3.00	3.00
	CO1	Understand the concept of entrepreneurship and the process of how to launch new ventures.	3		3	3	3
	CO2	Understand the main motives to start up venture and the Mindset of entrepreneur	3		3	3	3
	CO3	Understand the steps involved in identifying new ventures.	3		3	3	3
	CO4	Understand the role of financial aspect and its importance in entrepreneurship development.	3	1	3	3	3
	CO5	Understand the Legal challenges of Entrepreneurship Development.	3	3	3	3	3
	CO6	Understand the Strategic perspectives in entrepreneurship	3	2	3	3	3
	17MB1109OE	Corporate Social Responsibility	3.00	1.60	3.00	3.00	3.00
	CO1	Models of CSR.	3	1	3	3	3
	CO2	Environmental influences of CSR.	3	3	3	3	3
	CO3	International understanding of CSR and stand of India	3	1	3	3	3
	CO4	Impetus of drivers of CSR	3	2	3	3	3
	CO5	Limitations in practicing CSR	3	1	3	3	3
	CO6	Future of CSR	3		3	3	3
7	17MB1110HS	Business Communication Skills-Lab	3.00	1.00	2.00	2.33	2.50
	CO1	Communicate in real life situations.	3	1	3	3	3
	CO2	Write paragraphs, essays and compositions.	3	1		3	
	CO3	Practice business communication and correspondence.	3	1		1	
	CO4	Prepare business project proposals and report.	3	1	1	2	1
	CO5	Understand career building and develop own résumé.	3		1	2	3
	CO6	Succeed in profession with improved communication.	3		3	3	3
8	17MB1111MC	Office Automation Tools-Practice	3.00	3.00	1.00	1.80	2.83
	CO1	Practice MS-Office tools for business applications.	3	3		1	3
	CO2	Organize data suitably by employing various commands & logics of MS Word & MS Excel.	3	3			2
	CO3	Prepare effective PowerPoint Presentation	3	3		1	3
	CO4	Develop formats and designs using MS ACCESS.	3	3		2	3
	CO5	Develop effective MIS for an enterprise.	3	3	1	3	3
	CO6	Use suitable modules of ERP	3	3	1	2	3
II-Semester (I-MBA-II-Semester)							
1	17MB1201PC	Financial Management	3.00	3.00	1.00	2.00	3.00
	CO1	Understand importance of finance function & objectives.	3	3	1	3	
	CO2	Measure Cost of Capital and its impact on Profitability and Investment Decisions.	3	3			
	CO3	Evaluate & Rank various Capital Budgeting Projects under different methods.	3	3		1	
	CO4	Compute Value of Firm using Theories Capital Structure & Leverages.	3	3	1	1	
	CO5	Compute Price of Equity Share and Value of Firm with different levels of dividend payout ratios.	3	3			
	CO6	Prepare Funds Flow & Cash Flow statements considering IT & Dividend Provisions	3	3	1	3	3



2	17MB1202PC	Human Resources Management	3.00	3.00	3.00	3.00	2.50
	CO1	Understand and practice functions of HR under global scenario.	3		3	3	3
	CO2	Understand and follow suitable recruitment & placement techniques for an enterprise.	3	3	3	3	1
	CO3	Adapt suitable Training & Development techniques for different levels of organization and employees.	3	3	3	3	3
	CO4	Employ better performance appraisal techniques for career development.	3	3	3	3	
	CO5	Adapt competitive compensation schemes in light of mutual benefit.	3	3	3	3	
	CO6	Follow latest provisions of various labor laws and adapt to the organization.	3	3	3	3	3
3	17MB1203PC	Marketing Management	3.00	3.00	3.00	3.00	2.00
	CO1	Differentiate Market, Marketing, Marketing Management, and Market-Mix.	3	3	3	3	3
	CO2	Analyze customer environment to launch new products & brands.	3	3		3	3
	CO3	Adopt strategies for targeting, positioning and segmentation for new and existing products.	3	3		3	
	CO4	Design & develop Distribution Channels decisions for new products, customers and segments.	3	3		3	
	CO5	Develop and adopt promotion mix strategies suitable	3	3	3	3	1
	CO6	Adopt competitive pricing strategies suitable in different market conditions	3	3	3	3	1
4	17MB1204BS	Quantitative Analysis for Business Decisions	3.00	3.00	2.00	2.00	1.33
	CO1	Understand various tools & techniques of Operations Research useful for managerial decision-making.	3	3		1	
	CO2	Apply Assignment Models for managerial decision-making.	3	3			
	CO3	Apply Transportation Problems for managerial decision-making.	3	3		1	2
	CO4	Apply Decision Tree Model for decision making under probabilistic conditions.	3	3		3	1
	CO5	Determine Critical Path, Time Estimated to Complete Project using PERT and Crashing using CPM.	3	3	2		
	CO6	Generate IBF and use simplex procedure for maximizing contribution and minimizing cost with decision making relevance in functional areas of management	3	3		3	1
5	17MB1205PC	Business Environment	3.00	3.00	1.00	3.00	1.67
	CO1	Understand and draw inferences suitably based on industrial policies.	3	3	1	3	1
	CO2	Understand the impact of policy reforms on banking sector and in non-enterprise.	3	3	1	3	1
	CO3	Understand Operational Mechanism of Capital Markets.	3	3		3	
	CO4	Know advantage of liberalization, privatization and globalization policies to a firm	3	3		3	
	CO5	Understand trade policy of India and also about GATT & WTO.	3	3		3	
	CO6	Understand features of EXIM policies, Initiatives to FDI and legal framework.	3	3		3	3
6	17MB1206OE	Open Elective-2					
	17MB1206OE	Project Management	3.00	3.00	2.80	3.00	3.00
	CO1	Understand need and limitations of project management.	3	3	3	3	3
	CO2	Planning and controlling projects.	3	3	2	3	3
	CO3	Understand project execution	3	3		3	3
	CO4	Lead project team effectively	3	3	3	3	3

	CO5	Techniquesofmeasuringprojectsprogress.	3	3	3	3	3
	CO6	Techniquesprojectevaluation.	3	3	3	3	3
	17MB1207OE	CrossCulturalManagement	3.00	2.83	3.00	3.00	2.83
	CO1	Identifydeterminantsandlevelsofculture.	3	3	3	3	3
	CO2	Understandculturaldimensionsanddilemmas.	3	3	3	3	2
	CO3	Developsuitableculturalstrategyconsideringdiversity	3	2	3	3	3
	CO4	Developremediesinter-culturalcommunicationbarriers	3	3	3	3	3
	CO5	Workingwithinternationalsteams.	3	3	3	3	3
	CO6	Understandculturaldynamicsandremedies.	3	3	3	3	3
	17MB1208OE	ManagementInformationSystem	3.00	3.00	1.67	2.33	2.33
	CO1	UnderstandMISstructureandclassification.	3	3	1	3	2
	CO2	EmployMIS,ERP,DSSandESS.	3	3	1	3	2
	CO3	PlanningandControlMIS	3	3	1	1	3
	CO4	BuildMISforanorganization	3	3	1	1	3
	CO5	DevelopandimplementMIS.	3	3	3	3	1
	CO6	Understandcybercrimeproblemsandlimitations.	3	3	3	3	3
	17MB1209OE	Social&CommunityDevelopment	3.00	3.00	3.00	3.00	3.00
	CO1	UnderstandanddrawinferencessuitablybasedonCSRpolicies.	3	3	3	3	3
	CO2	UnderstandtheimpactofpolicyreformsonSocialdevelopment.	3	3	3	3	3
	CO3	UnderstandOperationalMechanismoftheoriesofdevelopment.	3	3	3	3	3
	CO4	Knowadvantageofliberalization,privatizationandglobalizationpoli ciestoafirm	3	3	3	3	3
	CO5	UnderstandsocialjusticeandempowermentrightsinIndia.	3	3	3	3	3
	CO6	Understandfeaturesofcorporatecommunitycollaboration	3	3	3	3	3
7	17MB1210PC	BusinessBestPractices-Seminar	3.00	3.00	3.00	3.00	3.00
	CO1	ReportonBusinessBestPractices	3	3	3	3	3
	CO2	DevelopBalancedScoreCard&setBenchmarksforanyorganization	3	3	3	3	3
	CO3	UnderstandandfollowCareerPlanningandCompetencyMappin g	3	3	3	3	3
	CO4	UnderstandtheimportanceofCapabilityMaturityModel&Peopl eCapabilityMaturityModel	3	3	3	3	3
	CO5	DevelopPerformanceManagementSystem&Talent Management	3	3	3	3	3
	CO6	EmployTotalQualityManagementPracticesinanorganization	3	3	3	3	3
8	17MB1211MC	BSRM-Practice	3.00	3.00	1.00	1.80	2.83
	CO1	UseMS-ExcellfordifferentTest- Statisticstosolvevariousmathematicalandstatisticallogics.	3	3		1	3
	CO2	ApplyMathematical,Statistical&LogicalFunctions&Formulasf orResearchMethodology&StatisticalAnalysis.	3	3			2
	CO3	PracticeVariousFunctional&NonFunctionalKeysascommands.	3	3		1	3
	CO4	Analyzethedatatrendstodrawinferencefordecisionmakingto testhypothesis.	3	3		2	3
	CO5	Applymeasuresofcentraltendencyanddispersionfordecision- making.	3	3	1	3	3
	CO6	Employparametricandnon-parametrictestsforhypothesetesting.	3	3	1	2	3
III–Semester(II–MBA–I–Semester)							



1	17MB2101PC	Strategic Management	3.00	3.00	3.00	3.00	2.17
	CO1	Assess suitability of environment in light of competitive advantage and conduct value chain analysis.	3	3	3	3	3
	CO2	Understand drivers of competitive actions and respond to rivalry dynamics.	3	3	3	3	2
	CO3	Assess the need for diversification; identify the role of Mergers & Acquisitions in restructuring.	3	3	3	3	2
	CO4	Need for global strategic alliances and in light of strategic advantage profile of an enterprise.	3	3	3	3	1
	CO5	Understand structural control of SBU, and implications of internal leadership and entrepreneurs.	3	3	3	3	2
	CO6	Identify the need for CSR, Professional Ethics, Values, Human Rights Issues and Cybercrimes.	3	3	3	3	3
2	17MB2102PC	Production & Operations Management	3.00	3.00	2.00	3.00	3.00
	CO1	Understand systems & types of production, production strategies and world class manufacturing.	3	3		3	
	CO2	Understand and follow concepts of product process design and analysis.	3	3		3	3
	CO3	Determine production capacity, conduct value engineering to standardize production by following rules ergonomics.	3	3		3	3
	CO4	Understand importance of plant location & plant layout and apply the principles to real life industry.	3	3		3	
	CO5	Schedule Machine Sequence by following priority dispatching rules and heuristic models.	3	3	2		
	CO6	Understand the importance of integrated materials management and determine EOQ & optimum quantity to be maintained in stores.	3	3		3	3
3	17MB2103PC	Organizational Behavior	3.00	1.17	3.00	2.67	2.83
	CO1	Importance of individual behavior in organization and remedies.	3	1	3	3	3
	CO2	Understanding perceptual influences on organizational and individual diversity.	3	1	3	3	2
	CO3	Understand group dynamics and its effect on group decision-making.	3	1	3	1	3
	CO4	Employ motivational models in real life.	3	2	3	3	3
	CO5	Follow leadership theories and decide on suitable style in given situation.	3	1	3	3	3
	CO6	Understand necessity for a change positively and avoid stress towards career development.	3	1	3	3	3
4		Professional Core Elective-1					
	17MB2104EN	Start-Up Management	3.00	3.00	2.20	3.00	2.67
	CO1	Answer few questions on research design, objectives and hypotheses of study.	3	3	3	3	3
	CO2	Enlist methods & types of data collection & limitations involved while collecting data suitably.	3	3	3	3	3
	CO3	Usefulness of Tools and Techniques and complications faced in data compilation and remedies.	3	3	3	3	3
	CO4	Explain the importance of test statistics used to support objectives & hypotheses.	3	3		3	3
	CO5	Enlist few specific findings to draw meaningful inferences.	3	3	1	3	1
	CO6	Specific recommendations based on sample observation and population behavior.	3	3	1	3	3
	17MB2104FI	Financial Institutions Markets & Services	3.00	2.33	2.50	3.00	2.33
	CO1	Understand structure of Indian financial system.	3	3	2	3	2
	CO2	Differentiate BFCs & NBFCs.	3	3		3	2

	CO3	Understand the functions and services provided by the commercial banks & cooperative banks.	3	3		3	
	CO4	Distinguish between statutory and non-statutory BFs and their services.	3	2		3	
	CO5	Understand and follow the operational mechanism of Indian Capital Markets and their services.	3	2		3	
	CO6	Utilize the products & services of different companies offering asset/fund based financial services	3	1	3	3	3
	17MB2104HR	Recruitment, Selection, Training and Development	3.00	3.00	3.00	3.00	3.00
	CO1	Identify various sources of recruitment in an organization.	3	3	3	3	3
	CO2	Assess the personality and testing ability.	3	3	3	3	3
	CO3	Design training program for selection of people.	3	3	3	3	3
	CO4	Understand the role of trainers in the recruitment and selection process.	3	3	3	3	3
	CO5	Understand the concept group development.	3	3	3	3	3
	CO6	Understand how action research helps in providing better training.	3	3	3	3	3
	17MB2104MA	Consumer Behavior & Brand Management	3.00	3.00	2.67	3.00	3.00
	CO1	Assess consumer behavior for Segmentation, Targeting, Positioning and Branding Products.	3	3	2	3	3
	CO2	Identify factors influencing consumer buying behavior.	3	3	2	3	3
	CO3	Understand and respond according to the consumer perceptual process.	3	3	3	3	3
	CO4	Assess the importance of attitudes, learning and information on consumer behavior.	3	3	3	3	3
	CO5	Understand the decision maker psychology which influences buying pattern and target.	3	3	3	3	3
	CO6	Understand the importance of consumerism and ethical principles followed towards consumer	3	3	3	3	3
5		Professional Core Elective-2					
	17MB2105EN	MSME	3.00	3.00	2.33	3.00	1.50
	CO1	Factors influencing and government policies towards MSME.	3	3	1	3	1
	CO2	Set-Up SSI/SME Units in IDAs or at any other notified/scheduled areas.	3	3		3	2
	CO3	Submit a DPR for funding.	3	3		3	1
	CO4	Apply for short term, long term and seed capital financing for proposed project.	3	3		3	1
	CO5	Management of working capital irregularities, cash credit limits, book-debt financing	3	3	3	3	1
	CO6	SICA Provision for revival of sick units.	3	3	3	3	3
	17MB2105FI	Advanced Accounting & Financial Mgt.	3.00	3.00	0.00	3.00	2.00
	CO1	Solve company final accounts problem.	3	3		3	
	CO2	Draft post restructure balance sheet.	3	3		3	2
	CO3	Assessment of assets, liabilities, capital reserve and good will due to restructure.	3	3		3	2
	CO4	Determine Cash & Bank Closing Balances using three column cash book and also BRS	3	3		3	
	CO5	Computation of working capital and EOQ of cash & its equivalents.	3	3		3	
	CO6	Identify average due date and EOQ for inventory using select inventory control techniques	3	3		3	
	17MB2105HR	Change Management & OD	3.00	2.33	3.00	3.00	3.00
	CO1	Follow process of organizational change.	3	1	3	3	3

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	CO2	EffectofcomponentsandconstraintsofOD.	3	3	3	3	3
	CO3	DiagnosizeODInterventions.	3	3	3	3	3
	CO4	UnderstandIndividual&GroupInterventionsinOD	3	3	3	3	3
	CO5	EmployTechno-structuralinterventionsforOD.	3	3	3	3	3
	CO6	TrendsofpowerpoliticsandODResearch	3	1	3	3	3
	17MB2105MA	SalesandDistributionManagement	3.00	3.00	3.00	3.00	3.00
	CO1	Understanddistinctionsbetweenselling&marketinganddevelopSalesstrategies.	3	3	3	3	3
	CO2	Developasalesplanandbudgetsuitabletotheorganization.	3	3	3	3	3
	CO3	Managementofsalesforcebyunderstandingthelimitations.	3	3	3	3	3
	CO4	Identifydifferentdistributionchannelsfordifferentproductsandservices.	3	3	3	3	3
	CO5	Design,Select,Motivate&TrainChannelMemberseffectively.	3	3	3	3	3
	CO6	DesignanddevelopaneffectiveChannelInformationSysteminlightofGlobal&RuralMarketing	3	3	3	3	3
6		ProfessionalCoreElective-3					
	17MB2106EN	Small&FamilyBusinessManagement	3.00	3.00	3.00	3.00	3.00
	CO1	Managingdifferenttypesofsmall&familybusinesses.	3	3	3	3	3
	CO2	Entouse,Encourage&MotivateEntrepreneurs.	3	3	3	3	3
	CO3	Employvariousmanagementfunctionseffectivelyoperationofbusiness	3	3	3	3	3
	CO4	Employsuitablestrategiesforsuccess	3	3	3	3	3
	CO5	Incorporateanyformofenterprisebyfollowingrelatedstatutoryprovisions	3	3	3	3	3
	CO6	EffectofIPRoncompanyR&D,productionandpromotionpractices.	3	3	3	3	3
	17MB2106FI	InvestmentAnalysis&Derivatives	3.00	3.00	3.00	3.00	3.00
	CO1	Identifystructure&classificationvarious typesofassetsandinvestments.	3	3		3	3
	CO2	Understand&followtypesofmoneymarketsandorder,margin,settlement&deliveryprocedures	3	3	3	3	3
	CO3	Conductsecurityanalysis,economic,fundamental,andtechnical.	3	3		3	3
	CO4	DeterminePriceofaBondusingbondduration,convexityandimmunizationtechniques.	3	3		3	
	CO5	FittrendlinebyidentifyingBeta.	3	3		3	3
	CO6	DetermineMinimumVariancePortfoliousingMarkowitzEfficientFrontiersandtestportfolioefficiencyusingJenson's,Sharpe'sandTyner'smeasuresortechiniques	3	3		3	3
	17MB2106HR	StrategicTalentManagement	3.00	2.50	3.00	3.00	3.00
	CO1	Talent-Acquisitionandretentionforthecompetitiveadvantageofanorganization.	3	1	3	3	3
	CO2	AssesstheprocessofManagingtalent.	3	3	3	3	3
	CO3	Retentionprocessbesttalent.	3	2	3	3	3
	CO4	SelfCompetencyMappingandEvaluation	3	3	3	3	3
	CO5	Toolstobedevelopedorusedincompetencyevaluationandmapping.	3	3	3	3	3
	CO6	Performanceassessmentatalllevelsoforganization.	3	3	3	3	3
	17MB2106MA	IntegratedMarketingCommunication	3.00	3.00	3.00	3.00	3.00



	CO1	UnderstandandfollowtheconceptsofIntegratedMarketingCommuni- cationandmix.	3	3	3	3	3
	CO2	DeploytimelyresourcesandevaluateofIMCsystem.	3	3	3	3	3
	CO3	Designsuitablemediaforadvertising.	3	3	3	3	3
	CO4	JustifyandEmployvarioussalespromotionmethodsthatfittocompan- yproductsandbrands.	3	3	3	3	3
	CO5	Followethicalaspectsofadvertisementandpromotionalmethods.	3	3	3	3	3
	CO6	Understandandfollowlegalprovisioninadvertisements	3	3	3	3	3
7	17MB2107MC	SoftSkills-Practice	3.00	1.00	2.00	2.33	2.50
	CO1	LoosefearofpublicspeakingandfeelconfidentwithfluencyinEnglish.	3	1	3	3	3
	CO2	ListentonormalconversationalandParticipateingroupdiscussions.	3	1		3	
	CO3	Respondspontaneouslyindifferentsocio-culturaland professionalcontexts.	3	1		1	
	CO4	Gainproficiencyinwritten&oralCommunication	3	1	1	2	1
	CO5	Faceinterviewsandbeabletoconvincetheirviewpoint.	3		1	2	3
	CO6	Confidentlyfaceandsucceedinthecorporateselectionprocesses	3		3	3	3
IV–Semester(II–MBA–II–Semester)							
1	17MBA2201PC	StrategicManagementAccounting	3.00	3.00	2.00	3.00	2.00
	CO1	DetermineelementsofcostsapportionindirectcostandcomputeMac- hineHourRateandpreparecostsheetforflexibleproductionlevels.	3	3		3	
	CO2	Allocate,apportionandabsorbdirectandindirectcostsagainst variousproducts/departmentsandprepareatender/quotation/estim- ateforsingleunitandalsoforabatch.	3	3	2	3	2
	CO3	PrepareCostSheet,DetermineUnitcostandcomputeinter- processprofitorlossfordifferentprocess.	3	3		3	2
	CO4	DetermineBreakEvenPoint,OptimumProduct/contribution/profit/ salesMixanddeterminekeyfactor orlimitingfactorcontribution.	3	3	2	3	
	CO5	ConductvarianceanalysisforMaterials,LaborandSales.	3	3		3	
	CO6	PrepareCash,Production,Materials,LabourandFlexibleBudget saspertheneedsoforganization.	3	3		3	
2		ProfessionalCoreElective-4					
	17MB2202EN	CreativityandInnovation	3.00	1.50	2.60	3.00	2.50
	CO1	TypesofInnovation.	3		3	3	
	CO2	InnovationModels.	3			3	
	CO3	Implementationofinnovationstrategy.	3	1	3	3	3
	CO4	InnovationSystemsworkinginpublicgood.	3	1	3	3	3
	CO5	IdeaIncubation&Innovation	3	1	1	3	1
	CO6	ThinktowardsEntrepreneurialCareer	3	3	3	3	3
	17MB2202FI	StrategicInvestment&FinancingDecisions	3.00	3.00	0.00	3.00	3.00
	CO1	Distinguishdifferenttypesofinvestments&cashflows,processofass- essingcapital-projects.	3	3		3	3
	CO2	RankprojectsunderDCFTechniquesandMean-VarianceApproach.	3	3		3	3
	CO3	Employmoderntechniquesinassessmentofprojects.	3	3		3	3
	CO4	UseDTA,TerminalValue,andEAC/EAVApproachforranking&ev- aluationofprojects.	3	3		3	3



	CO5	UseCAPM,PortfolioRisk,scenario,andsensitivityandsimulationsmodelsforrankingprojects.	3	3		3	3
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	CO6	Impactoffinancialdistress&agencytheoryonvalueoffirmandonstakeholders	3	3		3	3
	17MB2202HR	Performance, Compensation & Reward Mgt.	3.00	2.83	3.00	3.00	3.00
	CO1	Understandhowcompaniesdevelopcompensationmodelsandhowtheyareeffectivelyexecuted.	3	3	3	3	3
	CO2	Understandcomprehensivepaystructuresanddesignedparallelforthebenefitofemployeeperformance.	3	3	3	3	3
	CO3	Developtoolsformeasuringperformanceappraisalanddesignperquisitesandretirementbenefits.	3	3	3	3	3
	CO4	UnderstandtheroleofemployeeunionsinWageandsalaryfixation.	3	3	3	3	3
	CO5	UnderstandtheroleofGovernmentinandlegalissuesincompensationmanagement.	3	2	3	3	3
	CO6	Understandwhatarerewardsareofferedbythecompaniestotheiremployees.	3	3	3	3	3
	17MB2202MA	Retailing Management	3.00	3.00	1.50	3.00	1.67
	CO1	Identifytoolsandtechniques toovercomethecomplexitiesofretailing.	3	3	1	3	1
	CO2	Awarenessaboutshoppingatmosphereandculture.	3	3	2	3	1
	CO3	Ascertaindifferenttypesofcompetitionandfuturechangesinretailingcompetition.	3	3	2	3	3
	CO4	Developthestrategicpricingpoliciesandmanagingretailinventory.	3	3		3	3
	CO5	Developawarenessaboutretailbuyingbehaviorandmanagingretailing.	3	3	1	3	1
	CO6	Developpricingcontrols&createshoppingculture	3	3		3	1
3		Professional Core Elective-5					
	17MB2203EN	Foreign Trade & WTO	3.00	3.00	3.00	3.00	3.00
	CO1	TunewithIndianForeignTradePoliciesanditsinfluenceinpast,presentandfuture.	3	3		3	3
	CO2	AcquireknowledgeaboutImportPolicyandExportPromotionSchemes,SEZ,InstitutionsinvolvedinexportPromotion.	3	3		3	3
	CO3	Understand&usewherevernecessaryimport,exportprocedures,tariffsandquantitativerestrictions.	3	3	3	3	3
	CO4	Observeinstitutionalset-upforexportpromotionandassistance.	3	3	3	3	3
	CO5	IdentifypotentialmarketsforIndianproducts, TradeBlocksandRegionalEconomicCooperation.	3	3		3	3
	CO6	UnderstandandtunewithIndia'sForeignTradePoliciesanditsinfluenceonexportsandimports	3	3		3	3
	17MB2203FI	International Financial Management	3.00	3.00	3.00	3.00	2.40
	CO1	Understandswhy most domestic firm to choose international business and methods & theories followed by the MNCs.	3	3		3	2
	CO2	UnderstandtheimportantcomponentsofBopstatementhowitispreparedandhowitimpactionEconomy.	3	3		3	2
	CO3	Understandthekeyareasoftheforeignexchangeanditsmechanism,howitworks.	3	3		3	2
	CO4	UnderstandsthekeyroleofexchangeratesinforeignexchangemarketandRiskexposuremanagement.	3	3		3	
	CO5	DecideonFDIs, International Capital Budgeting, Capital structure & cost of capital.	3	3		3	3
	CO6	ListmeansofInternationalfinancialinstrumentsissued&theroleEXIMBankinIndia.	3	3		3	3
	17MB2203HR	International Human Resources Management	3.00	2.60	3.00	3.00	2.00
	CO1	UnderstandBasicsofIHRM, Importance, Nature, Scope and	3		3	3	

		components of IHRM.						
	CO2	Understand and develop various comprehensive methods of international recruitment and selection process.	3	3	3	3		
	CO3	able to develop effective medium of exchange for the betterment and efficient functioning of virtual organization.	3	3	3	3	3	
	CO4	Understand how Indian Managers- Response to HR practices across the World- Implication for multinationals.	3	2	3	3	1	
	CO5	Understand and develop competency skill in manager to overcome global issues.	3	2	3	3	1	
	CO6	Identify the impact of Information technology on Human Resource Management	3	3	3	3	3	
	17MB2203MA	International Marketing Management	3.00	3.00	2.50	3.00	1.75	
	CO1	Understand the difference between domestic and international marketing and various international marketing theories.	3			3		
	CO2	Understand the various components of global marketing environment and International Trade and its barrier trade.	3	3	3	3	1	
	CO3	Understand the opportunities in global markets.	3	3	3	3	1	
	CO4	Able to know and develop global market strategies for product segmentation and pricing.	3	3		3		
	CO5	Understand how global marketing strategies developed and implemented.	3	3	1	3	2	
	CO6	Understand marketing channels for global markets and E-Marketing channels organization & controlling of the global market in programmed.	3	3	3	3	3	
4		Professional Core Elective-6						
	17MB2204EN	Management of NGOs	3.00	3.00	3.00	3.00	3.00	
	CO1	Need for NGO's in society.	3	3	3	3	3	
	CO2	Register and Incorporate NGOs	3	3	3	3	3	
	CO3	Measuring the impact of NGO.	3	3	3	3	3	
	CO4	Institutional arrangements for Micro Finance and Micro credit	3	3		3	3	
	CO5	Necessity of Non-Profit Entity in societal development.	3	3	3	3	3	
	CO6	Encouragement from Corporate Bodies in development of NGOs	3	3	3	3	3	
	17MB2204FI	Risk Management and Insurance	3.00	3.00	3.00	3.00	3.00	
	CO1	Understand risk mitigation process.	3	3	3	3	3	
	CO2	Understand nature & types of insurance contracts.	3	3	3	3	3	
	CO3	Assess risk involved using different techniques.	3	3	3	3	3	
	CO4	Follow regulations & statutory compliances.	3	3	3	3	3	
	CO5	Employ risk minimization process.	3	3	3	3	3	
	CO6	Understand hedging risk and use derivative techniques	3	3	3	3	3	
	17MB2204HR	Leadership	3.00	2.33	3.00	3.00	3.00	
	CO1	Understand the role of leadership in the organization and leadership theories.	3	1	3	3	3	
	CO2	Understand what leadership approach and how to apply competency skills at different levels of leadership.	3	3	3	3	3	
	CO3	Understand and develop various leadership styles and Interpersonal skills.	3	3	3	3	3	
	CO4	Understand how leadership transformation takes place.	3	3	3	3	3	
	CO5	Understand dynamics of leadership and women leadership.	3	3	3	3	3	



	CO6	UnderstandtheroleofcultureandethicsinleadershipandEthicalTheories	3	1	3	3	3
	17MB2204MA	ServicesMarketing	3.00	1.80	2.00	3.00	2.17
	CO1	UnderstandtheimportantroleofServicesinModernEconomyandhowservicescomparedtogooods.	3		3	3	3
	CO2	Identifytheconsumerbehavioronservices,consumerrequirement sandrelationship.	3	3	3	3	2
	CO3	DevelopnewservicedesignandServiceDevelopmentProcesses.	3	3	3	3	3
	CO4	UnderstandhowtheServiceisdeliveredandperformed.	3	1	1	3	3
	CO5	Understandtheroleofemployee'sinservicedelivery.	3	1	1	3	1
	CO6	Understandthepricingandpromotionstrategiesappliedinservicesmarketing.	3	1	1	3	1
5	17MB2205PC	PreSubmissionofProjectWork	3.00	3.00	3.00	3.00	3.00
	CO1	Developobjectivesandhypothesesforhis/herproject.	3	3	3	3	3
	CO2	Identifysuitablequestionsthatfitfordatarequirements	3	3	3	3	3
	CO3	Compiledataforstatisticalfitness	3	3		3	3
	CO4	Developsuitablediagrams,graphs,chartsforhisstudy	3	3	3	3	3
	CO5	Identifycrosstablestofitforstatisticaltesting.	3	3	3	3	3
	CO6	Presentaseminar&abletoincorporatesuggestions&improvements	3	3	3	3	3
6	17MB2206PC	ComprehensiveVivaVoce	3.00	3.00	3.00	2.83	2.83
	CO1	Developunderstandingonvariouscourses	3	3	3	3	2
	CO2	Efficientlyfaceemploymentinterviews	3	3	3	3	3
	CO3	Testtheauthorityonvariouspecialistcourses	3	3		2	3
	CO4	Developspontaneous&instantresponseofthestudentandcomeoutofpanicsininterview.	3	3	3	3	3
	CO5	Facecompetitiveexams&succeedinacademic&employmentinterviews.	3	3	3	3	3
	CO6	Acquiredemonstrationkillsinfutureemploymentcareer	3	3	3	3	3
7	17MB2207PC	MainProjectReportEvaluation	3.00	3.00	3.00	2.83	2.83
	CO1	Formulateobjectivesandhypothesesofstudy.	3	3	3	3	2
	CO2	Collectdatatotestobjectivesandhypothesesofstudy.	3	3	3	3	3
	CO3	Compiledatawiththehelpofdiagrams,graphs,charts&crosstables.	3	3		2	3
	CO4	Applydifferenttypesofteststatisticstodrawmeaningfulinferences.	3	3	3	3	3
	CO5	Providespecificrecommendations.	3	3	3	3	3
	CO6	Prepareareportbyfollowingsspecificrulestopublishtheprojectreport inanyconferenceorjournal	3	3	3	3	3
8	17MB2208PC	MainProjectViva-Voce	3.00	3.00	3.00	2.83	2.83
	CO1	Answerfewquestionsonresearchdesign,objectivesandhypothesesofstudy.	3	3	3	3	2
	CO2	Enlistmethods&typesofdatacollection&limitationsinvolvedwhilecollectingdatasuitably.	3	3	3	3	3
	CO3	UsefulnessofToolsandTechniquesandcomplicationsfacedindata-compilationandremedies	3	3		2	3
	CO4	Explaintheimportanceofteststatisticusedtosupportobjectives&hypotheses	3	3	3	3	3
	CO5	Enlistfewspecificfindingstodrawmeaningfulinferences.	3	3	3	3	3
	CO6	Specificrecommendationsbasedonsampleobservationandpopulationbehavior.	3	3	3	3	3



		GRAND AVERAGE OF ALL PROGRAMME OUTCOMES					
PROGRAMME OUTCOME STATEMENTS MBA 2017 REGULATIONS							
1	PO-1	Apply knowledge of management theories and practices to solve business problems.					
1	PO-2	Foster Analytical and critical thinking abilities for data-based decision making.					
1	PO-3	Develop Value based Leadership ability.					
1	PO-4	Understand, analyze and communicate global, economic, legal, and ethical aspects of business.					
1	PO-5	Lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.					
END OF ACADEMIC YEAR 2017-18 CO PO GRAND MAPPING							

Tableno.-3-B: Course Correlation with PO Correlation table 2018-19 ACADEMIC YEAR 2018-19 AND 2019-20 (AUTONOMOUS)- FORTWO ACADEMIC YEARS

CMR INSTITUTE OF TECHNOLOGY							
DEPARTMENT OF MANAGEMENT STUDIES							
COURSE ARTICULATION MATRIX - ACADEMIC YEAR 2018-19 & 2019-20 - 2 YEARS							
I-MBA-I-Semester (I-Semester)							
No.	Subject Code	Subject Title	PO-1	PO-2	PO-3	PO-4	PO-5
1	18MBPCC1101	Management and Organizational Behavior	3.00	1.17	3.00	2.67	2.83
	CO1	Understand Fundamentals of Management and Approaches to management.	3	1	3	3	3
	CO2	Understand and employ various functions of management	3	1	3	3	2
	CO3	The process of organizing and its subfunctions.	3	1	3	1	3
	CO4	Understand the group dynamics	3	2	3	3	3
	CO5	Follow Organizational Culture, Structure, Design, & types of a hypothetical enterprise	3	1	3	3	3
	CO6	Exercise principles, styles & theories of Motivation & Leadership.	3	1	3	3	3
2	18MBPCC1102	Managerial Economics	3.00	3.00	1.67	3.00	1.67
	CO1	Apply principles of managerial economics to business decision making.	3	3	2	3	3
	CO2	Forecast demand-supply by assessing impact of different variables.	3	3		3	1
	CO3	Develop a suitable production function for own enterprise and its effect on scale of production.	3	3		3	
	CO4	Determine BEP and employ various applications of BEP for own enterprise.	3	3		3	
	CO5	Set price under different conditions.	3	3	2	3	
	CO6	Determine price & output under different market competitions.	3	3	1	3	1
3	18MBPCC1103	Financial Accounting & Analysis	3.00	3.00	1.00	3.00	1.00
	CO1	Develop accounting systems following accounting standards & Audit procedures	3	3	1	3	1
	CO2	Prepare Trial Balance & Reconcile Cash & Bank Statements	3	3		3	
	CO3	Develop Profit & Loss A/c & Balance Sheet considering additional information.	3	3		3	
	CO4	Analyze financial statements and draw meaningful inferences	3	3		3	

3/2/20

	CO5	Value of closing balances of investments and other fixed assets with suitable accounting procedures	3	3		3	
	CO6	Understand the process of company final accounts.	3	3		3	
4	18MBPCC1104	Business & Tax Laws	3.00	2.50	1.00	3.00	1.00
	CO1	Understand and perform contracts, against their remedies or breach of contract.	3	2	1	3	1
	CO2	Understand, follow and practice various provisions & procedures of Indian Companies Act, 1956.	3	2		3	1
	CO3	Determine residential status and compute tax on total taxable income.	3	2		3	
	CO4	Compute Income from Salary & House Property along with deductions and file Individual Return.	3	3		3	
	CO5	Understand and follow the Provisions & Procedures of GST Act.	3	3		3	1
	CO6	Understand role & relevance of Customs & Excise Laws its effect on GST Act	3	3		3	1
5	18MBPCC1105	Business Analytics	3.00	3.00	3.00	3.00	3.00
	CO1	Use business analytics models with test-statistics to forecast business.	3	3	3	3	3
	CO2	Present data using tables, charts, diagrams and graphs suitably.	3	3		3	
	CO3	Compute Mean, Median, Mode, SD, Variance, Skewness, and accept or reject the test results.	3	3		3	
	CO4	Compute correlation coefficient and fit a regression line.	3	3		3	
	CO5	Forecast sales level of a business enterprise using Trend Analysis.	3	3		3	
	CO6	Apply suitable parametric & non-parametric tests to test the validity & reliability of test statistics.	3	3		3	
6	18MBPCC1106	Entrepreneurship	3.00	2.00	3.00	3.00	3.00
	CO1	Understand the concept of entrepreneurship and the process of how to launch new ventures.	3		3	3	3
	CO2	Understand the main motives to start up venture and the Mindset of entrepreneur	3		3	3	3
	CO3	Understand the steps involved in identifying new ventures.	3		3	3	3
	CO4	Understand the role of financial aspect and its importance in entrepreneurship development.	3	1	3	3	3
	CO5	Understand the Legal challenges of Entrepreneurship Development.	3	3	3	3	3
	CO6	Understand the Strategic perspectives in entrepreneurship	3	2	3	3	3
7	18MBPCC1107	Business Analytics – Practice	3.00	3.00	1.00	1.80	2.83
	CO1	Practice MS-Office tools for business applications.	3	3		1	3
	CO2	Organize data suitably by employing various commands & logics of MS Word & MS Excel.	3	3			2
	CO3	Prepare effective Power Point Presentation	3	3		1	3
	CO4	Develop formats and designs using MS ACCESS.	3	3		2	3
	CO5	Develop effective MIS for an enterprise.	3	3	1	3	3
	CO6	Use suitable modules of ERP.	3	3	1	2	3
8	18MBPCC1108	Professional Communications-Practice	3.00	1.00	2.00	2.33	2.50
	CO1	Communicate in real life situations.	3	1	3	3	3
	CO2	Write paragraphs, essays and compositions.	3	1		3	
	CO3	Practice business communication and correspondence.	3	1		1	
	CO4	Prepare business project proposals and report.	3	1	1	2	1
	CO5	Understand career building and develop own resume.	3		1	2	3
	CO6	Succeed in profession with improved communication.	3		3	3	3



II–Semester(I–MBA–II–Semester)							
1	18MBPCC1201	Financial Management	3.00	3.00	1.00	2.00	3.00
	CO1	Understand importance of finance function & objectives.	3	3	1	3	
	CO2	Measure Cost of Capital and its impact on Profitability and Investment Decisions.	3	3			
	CO3	Evaluate & Rank various Capital Budgeting Projects under different methods.	3	3		1	
	CO4	Compute Value of Firm using Theories Capital Structure & Leverages.	3	3	1	1	
	CO5	Compute Price of Equity Share and Value of Firm with different level of payout ratios.	3	3			
	CO6	Compute working Capital, prepare cash budget & decide optimum level of cash	3	3	1	3	3
2	18MBPCC1202	Marketing Management	3.00	3.00	3.00	3.00	2.00
	CO1	Differentiate Market, Marketing, Marketing Management, and Market-Mix.	3	3	3	3	3
	CO2	Analyze customer environment to launch new products & brands.	3	3		3	3
	CO3	Adopt strategies for targeting, positioning and segmentation for new and existing products.	3	3		3	
	CO4	Design & develop Distribution Channels decisions for new products, customers and segments.	3	3		3	
	CO5	Develop and adopt promotion mix strategies suitable	3	3	3	3	1
	CO6	Adopt competitive pricing strategies suitable in different market conditions.	3	3	3	3	1
3	18MBPCC1203	Human Resources Management	3.00	3.00	3.00	3.00	2.50
	CO1	Understand and practice functions of HR under global scenario.	3		3	3	3
	CO2	Understand and follow suitable recruitment & placement techniques for an enterprise.	3	3	3	3	1
	CO3	Adapt suitable Training & Development techniques for different levels of organization and employees.	3	3	3	3	3
	CO4	Employ better performance appraisal techniques for career development.	3	3	3	3	
	CO5	Adapt competitive compensation schemes in light of mutual benefit.	3	3	3	3	
	CO6	Follow latest provisions of various labor laws and adapt to the organization.	3	3	3	3	3
4	18MBPCC1204	Production & Operations Management	3.00	3.00	2.00	3.00	3.00
	CO1	Understand systems & types of production, production strategies and world class manufacturing.	3	3		3	
	CO2	Understand and follow concepts of product process design and analysis.	3	3		3	3
	CO3	Determine production capacity, conduct value engineering to standardize production by following rules ergonomics.	3	3		3	3
	CO4	Understand importance of plant location & plant layout and apply the principle to real life industry.	3	3		3	
	CO5	Schedule Machine Sequence by following priority dispatching rules and heuristic models.	3	3	2		
	CO6	Understand the importance of integrated materials management and determine EOQ & optimum quantity to be maintained in stores.	3	3		3	3
5	18MBPCC1205	Quantitative Analysis for Business Decisions	3.00	3.00	2.00	2.00	1.33
	CO1	Understand various tools & techniques of Operations Research useful for managerial decision making.	3	3		1	



	CO2	Apply Assignment Models for managerial decision making.	3	3			
	CO3	Apply Transportation Problems for managerial decision making.	3	3		1	2
	CO4	Apply Decision Tree Model for decision making under probabilistic conditions.	3	3		3	1
	CO5	Determine Critical Path, Time Estimated to Complete Project using PERT and Crashing using CPM.	3	3	2		
	CO6	Generate IBFs and uses simplex procedure for maximizing contribution and minimizing cost with decision making relevance in functional areas of management.	3	3		3	1
6	18MBPCC1206	Business Environment	3.00	3.00	1.00	3.00	1.67
	CO1	Understand and draw inferences suitably based on industrial policies.	3	3	1	3	1
	CO2	Understand the impact of policy reforms on banking sector and in turn on enterprise.	3	3	1	3	1
	CO3	Understand Operational Mechanism of Capital Markets.	3	3		3	
	CO4	Know advantage of liberalization, privatization and globalization policies to a firm	3	3		3	
	CO5	Understand trade policy of India and also about GATT & WTO.	3	3		3	
	CO6	Understand features of EXIM policies, Initiatives to FDI and legal framework.	3	3		3	3
7	18MBPPC1207	Case Study Analysis-Practice	3.00	3.00	3.00	3.00	3.00
	CO1	To understand the importance of real expertise & judgment to excel in relevant areas.	3	3	3	3	3
	CO2	To acquaint the student to understand risks, make judgments in uncertain situations, and to propose multiple possible options.	3	3	3	3	3
	CO3	To work under realistic world and manage in crisis.	3	3	3	3	3
	CO4	To strategically manage and handle the actual business situations	3	3	3	3	3
	CO5	To exemplify the course of action that an organization tops to pursue.	3	3	3	3	3
	CO6	To develop alternatives and propose specific actions for the firm.	3	3	3	3	3
8	18MBPRC1208	Field/Market Watch/Study/Survey-Practice	3.00	3.00	3.00	3.00	3.00
	CO1	Understand and employ in any enterprise Report on Business Best Practices	3	3	3	3	3
	CO2	Develop Balanced Score Card & set Benchmarks for any organization	3	3	3	3	3
	CO3	Understand and follow Career Planning and Competency Mapping	3	3	3	3	3
	CO4	Understand the importance of Capability Maturity Model I & People Capability Maturity Model	3	3	3	3	3
	CO5	Develop Performance Management System & Talent Management	3	3	3	3	3
	CO6	Employ Total Quality Management Practices in an organization	3	3	3	3	3
III-Semester (II-MBA-I-Semester)							
1	18MBPCC2101	Strategic Management	3.00	3.00	3.00	3.00	2.17
	CO1	Assess suitability of environment in light of competitive advantage and conduct value chain analysis.	3	3	3	3	3
	CO2	Understand drivers of competitive actions and respond to rivalry dynamics.	3	3	3	3	2



	CO3	Assessthe needfordiversification; identifytheroleofMerges&Acquisitionsinrestructuring.	3	3	3	3	2
	CO4	Needforglobalstrategicalliancesandinlightofstrategica dvantageprofileofanenterprise.	3	3	3	3	1
	CO5	UnderstandstructuralcontrolsofSBU,and	3	3	3	3	2
		implicationsofinternalleadershipandentrepreneurs.					
	CO6	IdentifytheneedforCSR,ProfessionalEthics,Values,Hum anRightsIssuesandCyberCrimes.	3	3	3	3	3
2	18MBPCC2102	ResearchMethodology	3.00	2.67	1.00	1.67	2.00
	CO1	Toapplytheprinciplesofresearchmethodologyforthere searchdesignforminiandmajorprojects.	3	3	1	2	1
	CO2	Totestthevalidityandreliabilityofthemodeltobetestedund erthestudy.	3	3	1	1	2
	CO3	Tochoosetheappropriatesamplewithasuitablescaleofme asurement.	3	3		1	
	CO4	Toselectappropriatedatasources-primaryandsecondary.	3	3		1	2
	CO5	Toanalyzethedatastatisticallyanddrawinferences.	3	3	1	2	2
	CO6	TouseofExcelandSPSSinProjectReport	3	1		3	3
3	18MBOEC2103	OpenElective-1					
		A: Business Ethics & Corporate Governance	3.00	1.75	3.00	3.00	3.00
	CO1	Tounderstandanddifferentiatebusinessethicsandprofessi onalethics.	3		3	3	3
	CO2	Tounderstandethicalandpsychologicaldimensionstocont ainicybercrimes.	3		3	3	3
	CO3	Toanalyzeunethicalpracticesinanorganization.	3	2	3	3	3
	CO4	Toapplyprofessionalethicsinrespectivefields.	3	1	3	3	3
	CO5	Tounderstandandevaluatethecorporatestructures.	3	1	3	3	3
	CO6	Tograsptheimportantissuesrelatedtocorporategovernanc e.	3	3	3	3	3
	18MBOEC2103	B: Total Quality Management	3.00	3.00	3.00	3.00	3.00
	CO1	Selectandapplyappropriatetechniquesinidentifyingcusto merneeds,aswellasthequalityimpactthatwill beusedasinputsinTQMmethodologies;	3	3	3	3	3
	CO2	Measurethecostofpoorqualityandprocesseffectiveness andefficiencytotrackperformancequalityandtoidentif yareasforimprovement;	3	3	3	3	3
	CO3	Understandprovenmethodologiestoenhancemanagement processes,suchasbenchmarkingandbusinessprocessreeng ineering;	3	3	3	3	3
	CO4	Chooseaframeworktoevaluatetheperformanceexcellence ofanorganization, anddeterminethesetofperformanceindi catorsthatwillalignpeoplewiththeobjectivesoftheorganiz ation.	3	3	3	3	3
	CO5	UnderstandthemeasurementsofTQM.	3	3		3	
	CO6	ApplyglobalTQMstandards	3	3	3	3	3
	18MBOEC2103	C: DBMS	3.00	3.00	1.50	1.00	1.00
	CO1	Demonstratethebasicelementsofarelationaldatabasem anagementsystem,	3	3	2	1	1
	CO2	Understandrelationalalgebra&calculusouseinDBMS	3	3			
	CO3	Abilitytoidentifythedatamodelsforrelevantproblems.	3	3			
	CO4	Abilitytodesignentityrelationshipandconvertentityrelati onshipdiagramsinRDBMS	3	3			
	CO5	FormulateSQLqueriesontherespectdata.	3	3	1	1	1
	CO6	Applynormalizationforthe developmentof applications ofware's.	3	3		1	1



	18MBOEC2103	D: Disability & Rehabilitation	3.00	3.00	3.00	3.00	3.00
	CO1	Understanding disability & Rehabilitation.	3	3	3	3	3
	CO2	Understanding Etiology of disabilities.	3	3	3	3	3
	CO3	Understand about People with disability and society a. Disability.	3	3	3	3	3
	CO4	Social Work philosophy - principles, values & ethics, objectives & functions.	3	3	3	3	3
	CO5	The Approaches to disability rehabilitation a. Voluntary Social Action.	3	3	3	3	3
	CO6	The Rehabilitation Council of India Act, 1992 - The Persons with Disabilities Act, 1995	3	3		3	3
		E: C-Programming	3.00	3.00	2.00	1.00	1.00
	CO1	Demonstrate the basic knowledge of computer hardware and software.	3	3			
	CO2	Ability to write algorithms for solving problems.	3	3			
	CO3	Ability to draw flowcharts for solving problems.	3	3			
	CO4	Ability to code a given logic in C programming language.	3	3			
	CO5	Gain knowledge in using C language for solving problems.	3	3	2	1	1
	CO6	Different types of Structures.	3	3			
	18MBOEC2103	F: Disaster Management	3.00	2.83	2.33	3.00	3.00
	CO1	Knowing about the difference between hazard and disaster	3	3	1	3	
	CO2	Acquire the knowledge disaster Management	3	3	2	3	3
	CO3	Understand the vulnerability of ecosystem and infrastructure due to a disaster	3	3	3	3	3
	CO4	Acquire the knowledge of Disaster Management Phases	3	3	2	3	3
	CO5	Understand the hazard and vulnerability profile of India	3	3	3	3	3
	CO6	Disaster Management Act.	3	2	3	3	3
4	18MBPEC2104	Core Elective-1					
	18MBPEC2104	E: Startup Management	3.00	3.00	2.20	3.00	2.67
	CO1	Develop a start-up.	3	3	3	3	3
	CO2	Follow start-up ecosystem.	3	3	3	3	3
	CO3	Promotion strategies to be adopted for start-ups.	3	3	3	3	3
	CO4	Provide platform to build-operationalize product manufacture.	3	3		3	3
	CO5	Decide on scaling phase based on survey and technical potentiality of start-up.	3	3	1	3	1
	CO6	Flexible according to feasibility study	3	3	1	3	3
	18MBPEC2104	F: Security Analysis and Portfolio Management	3.00	3.00	1.00	3.00	2.50
	CO1	Portfolio Selection & Management Processes and theories.	3	3	1	3	3
	CO2	Identify structure & classification various types of assets and investments.	3	3		3	
	CO3	Understand & follow types of money markets and order, margin, settlement & delivery procedures	3	3		3	
	CO4	Conduct security analysis, economic, fundamental, and technical.	3	3		3	
	CO5	Determine Price of a Bond using bond duration, convexity and immunization techniques.	3	3	1	3	2
	CO6	Fit trend line by identifying Beta.	3	3		3	
	18MBPEC2104	H: Performance Management Systems	3.00	2.40	2.67	3.00	2.50
	CO1	Understand how companies develop compensation models and how they are effectively executed.	3		3	3	3



	CO2	Understand comprehensive pay structures and designed parallel for the benefit of employee performance.	3	3	3	3	
	CO3	Develop tools for measuring performance appraisal and design prerequisites and retirement benefits.	3	3	3	3	1
	CO4	Understand the role of employee unions in Wage and salary fixation.	3	1	1	3	
	CO5	Understand the role of Government in and legal issues in compensation management.	3	2	3	3	3
	CO6	Understand what are rewards are offered by the company to their employees.	3	3	3	3	3
	18MBPEC2104	M: Digital Marketing	3.00	2.00	2.00	3.00	2.75
	CO1	Trends of digital marketing in the globalized market	3			3	
	CO2	Understand and use Channels of Digital Marketing	3	1	1	3	3
	CO3	Develop a digital marketing plan	3	3	3	3	3
	CO4	Implement a digital marketing plan suitably	3	1		3	
	CO5	Selection of suitable search engine marketing	3	2	1	3	2
	CO6	Develop Online advertising plan	3	3	3	3	3
	18MBPEC2105	Core Elective-2					
	18MBPEC2105	E: Management of NGOs & MSME	3.00	3.00	2.33	3.00	1.50
	CO1	Impact of Indian Economy on MSME & develop of DPR for funding projects.	3	3	1	3	1
	CO2	Identify the Institutional Support to SME and industrial sickness	3	3		3	2
	CO3	Understand Project Finance Models	3	3		3	1
	CO4	Illustrate Management of Product Line.	3	3		3	1
	CO5	Working of NGOs	3	3	3	3	1
	CO6	Management of Social Enterprise	3	3	3	3	3
	18MBPEC2105	F: Financial Institutions, Markets and Services	3.00	2.33	2.50	3.00	2.33
	CO1	Understand structure of Indian financial system.	3	3	2	3	2
	CO2	Differentiate BFCs & NBFCs.	3	3		3	2
	CO3	Understand the functions and services provided by the commercial banks & cooperative banks.	3	3		3	
	CO4	Distinguish between statutory and non-statutory BFCs and their services.	3	2		3	
	CO5	Understand and follow the operational mechanism of Indian Capital Markets and their services.	3	2		3	
	CO6	Utilize the products & services of different companies offering gasset/fund based financial services	3	1	3	3	3
	18MBPEC2105	H: Learning & Development	3.00	3.00	3.00	3.00	3.00
	CO1	The importance of learning performance	3	3	3	3	3
	CO2	Training and Development strategies	3	3	3	3	3
	CO3	Training Need Analysis & methods of training	3	3	3	3	3
	CO4	Employee & Executive Development Methods	3	3	3	3	3
	CO5	Trends in EDPs	3	3	3	3	3
	CO6	Developing career management system	3	3	3	3	3
	18MBPEC2105	M: Advertising & Sales Management	3.00	3.00	2.60	3.00	2.60
	CO1	Will understand Advertising concept in marketing	3		3	3	
	CO2	Knows various Advertising Media	3	3	1	3	1
	CO3	Studies the Sales Management process	3	3		3	3
	CO4	Identifies the relation between Sales Management and Sales Personnel	3	3	3	3	3
	CO5	Understands role of sales promotion	3	3	3	3	3
	CO6	Analyze the role of Distribution Channels and enabling them to manage Channel Institutions.	3	3	3	3	3
6	18MBPEC2106	Core Elective-3					
	18MBPEC2106	E: Project Management	3.00	3.00	2.80	3.00	3.00



	CO1	Understandneedandlimitationsofprojectmanagement.	3	3	3	3	3
	CO2	Planningandcontrollingprojects.	3	3	2	3	3
	CO3	Understandprojectexecution	3	3		3	3
	CO4	Leadprojectteamseffectively	3	3	3	3	3
	CO5	Techniquesofmeasuringprojectsprogress.	3	3	3	3	3
	CO6	Techniquesprojectevaluation.	3	3	3	3	3
	18MBPEC2106	F:AdvancedManagementAccounting	3.00	3.00	2.00	3.00	2.00
	CO1	DetermineelementsofcostsapportionindirectcostandcomputeMachineHourRateandpreparecostsheetforflexibleproductionlevels.	3	3		3	
	CO2	Allocate,apportionandabsorbdirectandindirectcostsagainstvariousproducts/departmentsandprepareatender/quotation/estimateforsingleunitandalsoforabatch.	3	3	2	3	2
	CO3	PrepareCostSheet,DetermineUnitcostandcomputeinter-processprofitorlossfordifferentprocess.	3	3		3	2
	CO4	DetermineBreakEvenPoint,OptimumProduct/contribution/profit/salesMixanddeterminekeyfactororlimitingfactorcontribution.	3	3	2	3	
	CO5	Preparefunctionalbudgets&cashbudgetandflexiblebudgets.	3	3		3	
	CO6	DetermineCashorFundsfromOperationsandSourcesandUsesofCashorfunds.	3	3		3	
	18MBPEC2106	H:ManagementofIndustrialRelations	3.00	1.80	3.00	3.00	1.33
	CO1	FollowIRpolicyofIndia	3	2	3	3	1
	CO2	UnderstandroleoftradeunionisminIndia	3	2	3	3	1
	CO3	CollectivebargainingprocessinIndia	3		3	3	1
	CO4	Understandtripartismandconceptsofsocialdialogues	3	1	3	3	1
	CO5	Followandpracticevariousprovisionsunderlabourlegislations	3	1	3	3	1
	CO6	Understandsettlementmechanisminindustrialdisputes,boardsofarbitration,adjudicationandconciliation	3	3	3	3	3
	18MBPEC2106	M:ConsumerBehaviour	3.00	3.00	1.75	3.00	2.67
	CO1	AssessconsumerbehaviorforSegmentation,Targeting,PositioningandBrandingProducts.	3	3	1	3	3
	CO2	Identifyfactorsinfluencingconsumerbuyingbehavior.	3	3		3	3
	CO3	Understandandrespondaccordingtotheconsumerperceptualprocess.	3	3	1	3	3
	CO4	Assesstheimportanceofattitudes,learningandinformationonconsumerbehavior.	3	3		3	3
	CO5	Understandthedecisionmakerpsychologywhichinfluencebuyingpatternandtarget.	3	3	2	3	1
	CO6	Understandtheimportanceofconsumerismandethicalprinciplestobefollowedtowardsconsumer	3	3	3	3	3
7	18MBPPC2107	ComputerApplicationstoBusiness–Lab	3.00	3.00	1.67	1.67	1.67
	CO1	PracticeMS-Officetoolsforbusinessapplications.	3	3	1	1	1
	CO2	Organizedatasuitablybyemployingvariouscommands&logicsofMSWord&MSExcels.	3	3			
	CO3	PrepareeffectivePowerPointPresentation	3	3			
	CO4	DevelopformatsanddesignsusingMSACCESS.	3	3			
	CO5	DevelopeffectiveMISforanenterprise.	3	3	1	1	1
	CO6	UsesuitablemodulesofERP.	3	3	3	3	3
8	18MBPPC2108	ProfessionalDevelopment,Yoga&Spirituality–Practice	3.00	1.00	3.00	3.00	2.83
	CO1	LoosefearofpublicspeakingandfeelconfidentwithfluencyinEnglish.	3	1	3	3	3



	CO2	ListenonnormalconversationalandParticipateingroup discussions.	3		3	3	2
	CO3	Respondspontaneouslyindifferentsocio-culturaland professionalcontexts.	3		3	3	3
	CO4	Gainproficiencyinwritten&oralcommunication	3		3	3	3
	CO5	Faceinterviewsandbeabletoconvincetheirviewpoint.	3		3	3	3
	CO6	Confidentlyfaceandsucceedinthecorporateselection processes.	3		3	3	3
IV–Semester(II–MBA–II–Semester)							
1	18MBPCC2201	ManagementofTechnology	3.00	3.00	2.00	3.00	3.00
	CO1	Employsuitabletechnologyinbusiness.	3	3	3	3	3
	CO2	Adoptefficientandeffectivetechnologytowardsoptimum utilizationmanagerialresources	3	3	3	3	3
	CO3	DevelopProjectPlan&execute	3	3	1	3	3
	CO4	UnderstandthestagesofProjectLifeCycleanduseofTechnologyCurves	3	3	1	3	3
	CO5	Understandthenecessityoftechnologytransfer.	3	3	1	3	3
	CO6	UnderstandtheProcessofNewProductDevelopmentthroughBPR	3	3	3	3	3
2	18MBPCC2202	ERP&MIS	3.00	3.00	1.67	2.33	2.33
	CO1	UnderstandMISstructureandclassification.	3	3	1	3	2
	CO2	EmployMIS,ERP,DSSandESS.	3	3	1	3	2
	CO3	PlanningandControlMIS	3	3	1	1	3
	CO4	BuildMISforanorganization	3	3	1	1	3
	CO5	DevelopandimplementMIS.	3	3	3	3	1
	CO6	Understandcyber-crimeproblemsandlimitations.	3	3	3	3	3
3	18MBOEC2203	OpenElective-2					
	18MBOEC2203	A: KnowledgeManagement	3.00	3.00	3.00	3.00	3.00
	CO1	UnderstandtheprevailingtoolsofKManditsapplicationsto business.	3	3	3	3	3
	CO2	UnderstandandimplementITinputstomanagebusiness	3	3	3	3	3
	CO3	Understandthechallengesofmanufacturing&services sectors	3	3	3	3	3
	CO4	Studytheimportanceofknowledgecapitalanditsusefulness inCRM	3	3	3	3	3
	CO5	EffectivelyemployKMprocessesintothebusinessdevelopment	3	3	3	3	3
	CO6	GettheadvantageofKM	3	3	3	3	3
	18MBOEC2203	B: R-Programming	3.00	3.00			
	CO1	Usedifferentdatatypes,structuresusedformathematical& statisticaloperationsinR	3	3			
	CO2	EmploycontrolstatementsandloopsinR	3	3			
	CO3	EmployvariousmathematicaloperationusingR	3	3			
	CO4	ApplyRtoolsfordescriptive&inferentialstatisticsandgraphics	3	3			
	CO5	Appreciatemultivariate modelsthroughR	3	3			
	CO6	DrawmeaningfulconclusionbyusingNonLinearModels	3	3			
	18MBOEC2203	C: Marketing&SupplyChainAnalytics	3.00	3.00	3.00	3.00	3.00
	CO1	UnderstandgrowingimportanceofSupplyChainManagement	3	3	3	3	3
	CO2	StudiesSCMCostsandPerformance	3	3	3	3	3
	CO3	KnowtheBenchmarkinginSCM	3	3	3	3	3
	CO4	IdentifiesSourcingandtransportation	3	3	3	3	3
	CO5	LearnsGlobalaspectsinSCM	3	3	3	3	3



	CO6	IssuesandChallengesinGlobalsupplychainManagement	3	3	3	3	3
	18MBOEC2203	D: Cross Cultural Management	3.00	2.83	3.00	3.00	2.83
	CO1	Understandstheroleofcultureinthebusiness.	3	3	3	3	3
	CO2	UnderstandsDeterminantsofCulture	3	3	3	3	2
	CO3	MeaningofCulturalDimensionsandDilemmas	3	2	3	3	3
	CO4	RoleofCultureinOrganizations	3	3	3	3	3
	CO5	UseofCultureandCommunications	3	3	3	3	3
	CO6	LevelsCrossCulturalTeamManagement	3	3	3	3	3
	18MBOEC2203	E: E-Commerce	3.00	3.00	1.50	3.00	1.50
	CO1	UnderstandtheroleofElectronicCommerceinbusiness	3	3	3	3	3
	CO2	BasicBlocksofe-commerce	3	3	1	3	1
	CO3	KnowsHowtoManagingthee-Enterprise	3	3	1	3	1
	CO4	UnderstandstheRisksofInsecureSystems	3	3	2	3	2
	CO5	LearnstheElectronicPaymentSystems	3	3	1	3	1
	CO6	WebsiteDesignIssues	3	3	1	3	1
	18MBOEC2203	F: Cyber Security	3.00	3.00	2.33	3.00	3.00
	CO1	UnderstandaboutCyber-crimes&types	3	3	3	3	3
	CO2	UsesvariousToolsandmethodsusedincybercrime	3	3	2	3	3
	CO3	Knowshowtostudycomputerforensic	3	3	2	3	3
	CO4	ForensicofHand	3	3	2	3	3
	CO5	UnderstandsCyberSecurity	3	3	2	3	3
	CO6	KnowsProtectingpeopleprivacyintheorganizations	3	3	3	3	3
4	18MBPEC2204	Core Elective-4					
	18MBPEC2204	E: Entrepreneurial Finance & Marketing	3.00	2.50	2.00	3.00	1.50
	CO1	Financingthroughventurelifecycle&Organizingandoperatingtheenterprise	3		1	3	
	CO2	FinancialPlanning,Valuation&Financingforgrowingenterprises.	3	3	3	3	1
	CO3	Marketingchallengesandtoapplymarketingtoolsandmodelsforentrepreneurialmarketing.	3		1	3	
	CO4	Marketingmixofanenterprise&Growthandmarketingstrategies	3	3	1	3	1
	CO5	MarketDevelopmentstrategies&ContemporaryissuesinEntrepreneurialmarketing.	3	3	3	3	1
	CO6	EntrepreneurialMarketingTools	3	1	3	3	3
	18MBPEC2204	F: International Financial Management	3.00	3.00	3.00	3.00	2.40
	CO1	Understandswaymostdomesticfirmtochooseinternationalbusinessandmethods&theoriesfollowedbytheMNCs.	3	3		3	2
	CO2	UnderstandtheimportantcomponentsofBoPstatementhowitispreparedandhowitimpactionEconomy.	3	3		3	2
	CO3	Understandthekeyareasoftheforeignexchangeanditsmechanism,howitworks.	3	3		3	2
	CO4	UnderstandsthekeyroleofexchangeratesinforeignexchangemarketandRiskexposuremanagement.	3	3		3	
	CO5	DecideonFDIs,InternationalCapitalBudgeting,Capitalstructure&costofcapital.	3	3		3	3
	CO6	ListmeansofInternationalfinancialinstrumentsissued&theroleEXIMBankinIndia	3	3		3	3
	18MBPEC2204	H: International Human Resource Management	3.00	2.60	3.00	3.00	2.00
	CO1	UnderstandBasicsofIHRM,Importance,Nature,ScopeandcomponentsofIHRM.	3		3	3	



	CO2	Understandanddevelopsvariouscomprehensivemethodsofinternationalrecruitmentandselectionprocess.	3	3	3	3	
	CO3	abletodevelopeffectivemediumofexchangeforthebettermentandefficientfunctioningofvirtualorganization.	3	3	3	3	3
	CO4	UnderstandhowIndianManagers-ResponsestoHRpracticesacrosstheWorld-Implicationformultinationals.	3	2	3	3	1
	CO5	Understandanddevelopscompetencyskillinmanagerstoovercomeglobalissues.	3	2	3	3	1
	CO6	IdentifiestheimpactofInformationtechnologyonHumanResourceManagement	3	3	3	3	3
	18MBPEC2204	M: Customer Relationship Management	3.00	3.00	3.00	3.00	3.00
	CO1	TounderstandtheimportanceofCustomerRelationshipManagementinBusiness.	3	3	3	3	3
	CO2	Howtobuildingcustomerrelations	3	3	3	3	3
	CO3	StudyCRMprocess	3	3	3	3	3
	CO4	AnalyzeCRMstructures	3	3	3	3	3
	CO5	SynthesisofPlanningandImplementationofCRM.	3	3	3	3	3
	CO6	UnderstandCRMsoftwarepackages	3	3	3	3	3
5	18MBPEC2205	Core Elective-5					
	18MBPEC2205	E: Intellectual Property Rights (IPR)	3.00	3.00	3.00	3.00	3.00
	CO1	UnderstandsNeedofIPR	3	3	3	3	3
	CO2	AboutPatentsandTypes	3	3	3	3	3
	CO3	ProcessofobtainingTrademarksandCopyrights	3	3	3	3	3
	CO4	ProcessofDesignsandGeographicalIndication	3	3	3	3	3
	CO5	LatestIPRGlobalChallenges	3	3	3	3	3
	CO6	KnowsaboutIPRInternationalConventions	3	3	3	3	3
	18MBPEC2205	F: Strategic Investment & Financing Decisions	3.00	3.00	0.00	3.00	3.00
	CO1	Distinguishdifferenttypesofinvestments&cashflows,processofassessingcapital-projects.	3	3		3	3
	CO2	RankprojectsunderDCFTechniquesandMean-VarianceApproach.	3	3		3	3
	CO3	Employmoderntechniquesinassessmentofprojects.	3	3		3	3
	CO4	UseDTA, Terminal Value, and EAC/EAV Approach for ranking & evaluation of projects.	3	3		3	3
	CO5	UseCAPM, Portfolio Risk, scenario, and sensitivity and simulations models for ranking projects.	3	3		3	3
	CO6	Impactoffinancialdistress&agencytheoryonvalueoffirm and on stakeholders	3	3		3	3
	18MBPEC2205	H: Leadership & Change Management	3.00	2.33	3.00	3.00	3.00
	CO1	Leadership, Role and function of a Leader	3	1	3	3	3
	CO2	Leadership theories and styles	3	3	3	3	3
	CO3	Organizational change concepts	3	3	3	3	3
	CO4	Perspectives of change	3	3	3	3	3
	CO5	Strategies for Managing change	3	3	3	3	3
	CO6	Developing Leadership Skills	3	1	3	3	3
	18MBPEC2205	M: International Marketing Management	3.00	2.40	2.00	3.00	1.40
	CO1	Understandthedifferencebetweendomesticandinternationalmarketingandvariousinternationalmarketingtheories.	3	0	0	3	0
	CO2	UnderstandthevariouscomponentsofglobalmarketingenvironmentandInternationalTradeanditsbarrierstrade.	3	3	3	3	1
	CO3	Understandtheopportunitiesinglobalmarkets.	3	3	3	3	1
	CO4	Abletoknowanddevelopinglobalmarketstrategiesforproductsegmentationandpricing.	3			3	

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	CO5	Understandhowglobalmarketingstrategiesdevelopedand implemented.	3	3	1	3	2
	CO6	Understandmarketingchannelsforglobalmarkets andE- Marketingchannelsorganization&controllingoftheglobalmarketingprogrammed.	3	3	3	3	3
6	18MBPEC2206	Core Elective-6					
	18MBPEC2206	E: Creativity, Innovation and Entrepreneurship	3.00	1.50	2.60	3.00	2.50
	CO1	Mastering Creative Problem Solving	3		3	3	
	CO2	basics of Creativity	3			3	
	CO3	Creative Problemsolving	3	1	3	3	3
	CO4	Creative Intelligence	3	1	3	3	3
	CO5	Perspectives of Innovation	3	1	1	3	1
	CO6	Role of Technology Communities in organization.	3	3	3	3	3
	18MBPEC2206	F: Banking Insurance & Risk Management	3.00	3.00	3.00	3.00	3.00
	CO1	Understand Banking Business	3	3	3	3	3
	CO2	Knows Latest Banking Reforms and Regulations	3	3	3	3	3
	CO3	Identifies The Role of Insurance and Types	3	3	3	3	3
	CO4	Need of Insurance Business Environment	3	3	3	3	3
	CO5	Role Risk in Banking and Insurance	3	3	3	3	3
	CO6	Need for Risk Management	3	3	3	3	3
	18MBPEC2206	H: Strategic Talent Management	3.00	2.50	3.00	3.00	3.00
	CO1	Understands the importance of nurturing talent and managing knowledge in the organization.	3	1	3	3	3
	CO2	Talent Management Process	3	3	3	3	3
	CO3	Need for Succession and career planning approaches	3	2	3	3	3
	CO4	Knows Knowledge management aspects	3	3	3	3	3
	CO5	Uses Knowledge management assessment and solutions	3	3	3	3	3
	CO6	Identifies Importance of KM Assessment	3	3	3	3	3
	18MBPEC2206	M: Marketing of Services	3.00	1.80	2.00	3.00	2.17
	CO1	Practicing Marketing of companies offering Services	3		3	3	3
	CO2	Following and practicing qualities of services,	3	3	3	3	2
	CO3	Following trends of consumer behavior in services,	3	3	3	3	3
	CO4	Design and align service design standards,	3	1	1	3	3
	CO5	Ensure deliverables in service	3	1	1	3	1
	CO6	Managing services promises service mix in different sectors	3	1	1	3	1
7	18MBPRC2207	Comprehensive Viva Voce	3.00	3.00	3.00	3.00	3.00
	CO1	Develop understanding on various courses	3	3	3	3	3
	CO2	Efficiently face employment interviews	3	3	3	3	3
	CO3	Test the authority on various specialist courses	3	3		3	3
	CO4	Develops spontaneous & instant response of the student and come out of nervousness in interview.	3	3	3	3	3
	CO5	Face competitive exams & succeed in academic & employment interviews.	3	3	3	3	3
	CO6	Acquire demonstration skills in future employment career.	3	3	3	3	3
8	18MBPRC2208	Main Project Review & Viva Voce	3.00	3.00	3.00	2.83	2.83
	CO1	Develop objectives and hypotheses for his/her project.	3	3	3	3	2
	CO2	Identify suitable questions that fit for data requirementst otest	3	3	3	3	3
	CO3	Compiled data for statistical fitness	3	3		2	3
	CO4	Develop suitable diagrams, graphs, charts for his study	3	3	3	3	3
	CO5	Identify cross tablest of fit for statistical testing.	3	3	3	3	3
	CO6	Present a seminar & incorporate suggestions & improvements constructively.	3	3	3	3	3



		GRAND AVERAGE OF ALL PROGRAMME OUTCOMES				
NO	PO	PROGRAMME OUTCOME DESCRIPTION				
1	PO-1	Apply knowledge of management theories and practices to solve business problems.				
2	PO-2	Foster Analytical and critical thinking abilities for data-based decision making.				
3	PO-3	Develop Value based Leadership ability.				
4	PO-4	Understand, analyze and communicate global, economic, legal, and ethical aspects of business.				
5	PO-5	Lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.				
END OF ACADEMIC YEAR 2018-19 CO PO GRAND MAPPING						

Tableno.-3-C:CourseCorrelationwithPOCorrelationtable2020-21and2021-22ACADEMICYEAR2020-21(AUTONOMOUS)

CMRINSTITUTE OF TECHNOLOGY								
DEPARTMENT OF MANAGEMENT STUDIES								
COURSE ARTICULATION MATRIX- ACADEMIC YEARS 2020-21 AND 2021-22- TWO YEARS								
I-MBA-I-Semester(I-Semester)								
No.	Subject Code	Subject Title	PO-1	PO-2	PO-3	PO-4	PO-5	
1	20MBAPC101	Management and Organizational Behavior	3.00	1.00	2.60	2.60	2.80	
	CO1	apply management principles	3	1	3	3	3	
	CO2	implement planning & controlling techniques	3	3	3	3	2	
	CO3	develop suitable organization structure	3	1	1	1	3	
	CO4	build organizational culture	3	0	3	3	3	
	CO5	judge various theories of motivation and leadership	3	0	3	3	3	
2	20MBAPC102	Managerial Economics	3.00	3.00	1.00	3.00	0.60	
	CO1	apply managerial economic fundamentals	3	3	3	3	2	
	CO2	implement demand and supply laws	3	3	0	3	1	
	CO3	derive various production equations	3	3	0	3	0	
	CO4	distinguish long-run, short-run cost curves behavior	3	3	0	3	0	
	CO5	determine equilibrium price & output	3	3	2	3	0	
3	20MBAPC103	Financial Accounting & Analysis	3.00	3.00	0.20	3.00	0.20	
	CO1	appraise accounting principles	3	3	1	3	1	
	CO2	maintain subsidiary books	3	3	0	3	0	
	CO3	prepare balance sheet	3	3	0	3	0	
	CO4	analyze financial performance	3	3	0	3	0	
	CO5	examine asset valuation methods	3	3	0	3	0	
4	20MBAPC104	Business & Tax Laws	3.00	2.20	0.40	3.00	0.20	
	CO1	evaluate contract laws	3	3	0	3	0	
	CO2	distinguish negotiable instruments	3	1	0	3	0	
	CO3	explain proceedings of Indian Companies Act	3	1	1	3	1	
	CO4	compute taxable income	3	3	1	3	0	
	CO5	outline salient features of GST Act	3	3	0	3	0	
5	20MBAPC105	Statistics for Managers	3.00	3.00	0.20	3.00	0.20	
	CO1	apply the concepts of statistics to business	3	3	1	3	1	
	CO2	measure various averages and dispersion	3	3	0	3	0	
	CO3	draw charts, graphs, diagrams and compute correlation coefficient	3	3	0	3	0	
	CO4	Evaluate regression coefficients	3	3	0	3	0	
	CO5	Estimate sales trend under different methods	3	3	0	3	0	
6	20MBAPC106	Business Environment	3.00	3.00	0.40	3.00	0.40	
	CO1	interpret regulatory environment	3	3	1	3	1	
	CO2	assess economic policies	3	3	1	3	1	
	CO3	analyze capital markets	3	3	0	3	0	
	CO4	examine trade policies	3	3	0	3	0	
	CO5	summarize FEMA, EXIM and FDI	3	3	0	3	0	
7	20MBAPC107	Statistics for Managers-Practice	3.00	3.00	0.00	0.60	0.60	
	CO1	make use of MS Office Tools	3	3	0	0	0	
	CO2	Compute measures of central tendency and dispersion using Excel	3	3	0	0	0	
	CO3	analyze frequency table to present data suitably	3	3	0	0	0	
	CO4	Determine correlation & regression coefficients	3	3	0	0	0	
	CO5	Test hypotheses through parametric and non-parametric tests	3	3	0	3	3	
8	20MBAPC108	Professional Communication Skills Practice	3.00	0.80	1.00	2.20	1.40	
	CO1	communicate effectively	3	1	3	3	3	
	CO2	exhibit written communication skills	3	1	0	3	0	
	CO3	model appropriate business correspondence	3	1	0	1	0	



	CO4	preparebusinessprojectproposal	3	1	1	2	1
	CO5	excelinprofessionalandsocialtietiquette	3	0	1	2	3
I-MBA-II-Semester(II-Semester)							
No.	SubjectCode	SubjectTitle	PO-1	PO-2	PO-3	PO-4	PO-5
1	20MBAPC201	FinancialManagement	3.00	3.00	0.40	1.00	0.00
	CO1	applyfinancefundamentals	3	3	1	3	0
	CO2	evaluatefinancemix	3	3	0	0	0
	CO3	illustratecapitalbudgetingproposals	3	3	0	1	0
	CO4	assessthevalueofafirm	3	3	1	1	0
	CO5	Outlinemanagementofcurrentassets	3	3	0	0	0
2	20MBAPC202	MarketingManagement	3.00	3.00	1.20	3.00	1.40
	CO1	applymarketingconcepts	3	3	3	3	3
	CO2	analyzemarketingenvironment	3	3	0	3	3
	CO3	illustratemarketingmix	3	3	0	3	0
	CO4	designdistributionchannels	3	3	0	3	0
	CO5	buildpriceandpromotionalstrategies	3	3	3	3	1
3	20MBAPC203	HumanResourcesManagement	3.00	2.00	3.00	3.00	1.40
	CO1	applyprinciplesofhumanresources	3	0	3	3	3
	CO2	develophumanresourceplan	3	3	3	3	1
	CO3	assessperformancelevels	3	3	3	3	3
	CO4	buildsuitablecompensationschemes	3	3	3	3	0
	CO5	adaptprovisionsofvariouslabourlaws	3	1	3	3	0
4	20MBAPC204	Production&OperationsManagement	3.00	3.00	0.00	2.40	1.20
	CO1	developmanufacturingsystems	3	3	0	3	0
	CO2	modelproductprocesses	3	3	0	3	3
	CO3	analyzeprocessdesign	3	3	0	3	3
	CO4	designappropriatelayout	3	3	0	3	0
	CO5	preparePPCschedules	3	3	0	0	0
5	20MBAPC205	QuantitativeAnalysisforBusinessDecisions	3.00	3.00	0.00	1.00	0.60
	CO1	developIBFSusingOR	3	3	0	1	0
	CO2	identifynondegeneratesolutions	3	3	0	0	0
	CO3	assessstrategicoutcomesusingDTAandgametheory	3	3	0	1	2
	CO4	appraiseprojects	3	3	0	3	1
	CO5	solveLPP	3	3	0	0	0
6	20MBAPC206	Entrepreneurship	3.00	0.80	3.00	3.00	3.00
	CO1	applyentrepreneurshipprinciples	3	0	3	3	3
	CO2	analyzeentrepreneurs'mindset	3	0	3	3	3
	CO3	incubateinnovativeideas	3	0	3	3	3
	CO4	identifyentrepreneurs'challenges	3	1	3	3	3
	CO5	testthestrategicviability	3	3	3	3	3
7	20MBAPC207	ProfessionalManagerialSkillsPractices	3.00	2.00	2.00	2.40	2.00
	CO1	analyzethecases	3	3	3	3	3
	CO2	recallthecases	3	0	0	1	0
	CO3	evaluatesolutions	3	3	3	3	3
	CO4	demonstratereal-lifesituations	3	2	3	3	3
	CO5	writecases	3	2	1	2	1
8	20MBAPC208	FinancialAnalysis&Reporting-Practice	3.00	3.00	0.40	1.20	1.00
	CO1	Identifyrelationshipamongvariouscomponentsoffinancialstatements	3	3	0	1	0
	CO2	Constructfinancialstatements	3	3	0	1	1
	CO3	Illustratetechniquesofprotectingfinancialdata	3	3	0	2	1
	CO4	Generatecustomizedfinancialreportformats	3	3	1	1	1
	CO5	Assesstheperformanceofresponsibilitycenters	3	3	1	1	2
II-MBA-I-Semester(III-Semester)							
No.	SubjectCode	SubjectTitle	PO-1	PO-2	PO-3	PO-4	PO-5



1	20MBAPC301	Strategic Management	3.00	3.00	3.00	3.00	2.00
	CO1	analyze environment using SWOT analysis	3	3	3	3	3
	CO2	conduct strategic analysis using various tools	3	3	3	3	2
	CO3	formulate strategies	3	3	3	3	2
	CO4	develop global strategies	3	3	3	3	1
	CO5	implement strategic plan	3	3	3	3	2
2	20MBAPC302	Research Methodology	3.00	3.00	0.60	1.40	1.40
	CO1	apply principles of research methodology	3	3	1	2	1
	CO2	design a business research plan	3	3	1	1	2
	CO3	originate cross tab data	3	3	0	1	0
	CO4	implement scaling techniques	3	3	0	1	2
	CO5	prepare a model report	3	3	1	2	2
3		Open Elective-1					
	20MBAOE301	Disaster Management	3.00	3.00	2.20	3.00	2.40
	CO1	analyze impact of disasters	3	3	1	3	0
	CO2	choose suitable disaster management mechanism	3	3	2	3	3
	CO3	Identify capacity building measure for risk mitigation	3	3	3	3	3
	CO4	develop strategies to cope up with disasters	3	3	2	3	3
	CO5	build disaster management plan	3	3	3	3	3
	20MBAOE302	Total Quality Management	3.00	3.00	2.40	3.00	2.40
	CO1	adapt quality philosophy to real time business environment	3	3	3	3	3
	CO2	interpret quality perceptions	3	3	3	3	3
	CO3	improve quality using process reengineering methods	3	3	3	3	3
	CO4	build quality benchmarks	3	3	3	3	3
	CO5	relate ISO standards to products/processes	3	3	0	3	0
	20MBAOE303	Environmental Science	3.00	1.40	1.00	3.00	0.20
	CO1	Identify the importance, Scope and role of ecosystem in our lives	3	1	3	3	1
	CO2	Explore available resources in light of environmental protection	3	2	1	3	0
	CO3	Outline bio-diversity and its relevance to ecological balance	3	2	1	3	0
	CO4	Explain laws and legislations on environmental protection	3	1	0	3	0
	CO5	Evaluate technologies for achieving sustainable development	3	1	0	3	0
	20MBAOE304	C-Programming	3.00	3.00	0.00	0.00	0.00
	CO1	write simple programs using C language	3	3	0	0	0
	CO2	design structured programs using functions	3	3	0	0	0
	CO3	develop programs using arrays, strings and pointers	3	3	0	0	0
	CO4	construct programs for heterogeneous data	3	3	0	0	0
	CO5	implement various file operations in C programming	3	3	0	0	0
4		Core Elective-1					
	20MBAPE301	E: Startup Management	3.00	3.00	2.00	3.00	2.60
	CO1	identify the scope for startups	3	3	3	3	3
	CO2	develop startup ecosystems	3	3	3	3	3
	CO3	formulate promotional strategies for new startups	3	3	3	3	3
	CO4	model a product validation process	3	3	0	3	3
	CO5	apply regulatory framework and scaling metrics	3	3	1	3	1
	20MBAPE304	F: Indian Financial System	3.00	1.80	0.40	3.00	0.80
	CO1	analyze financial system and Indian economy	3	3	2	3	2
	CO2	identify various components and instruments in financial markets	3	1	0	3	2
	CO3	illustrate performance of various financial institutions	3	3	0	3	0
	CO4	compare various services provided by financial institutions	3	1	0	3	0
	CO5	outline role and responsibilities of financial regulatory bodies	3	1	0	3	0
	20MBAPE307	H: Recruitment, Selection & Induction	3.00	2.00	2.60	2.60	2.40
	CO1	Identify importance of recruitment	3	0	1	1	0
	CO2	Illustrate the process of recruitment	3	3	3	3	3
	CO3	Evaluate and price a job position	3	3	3	3	3
	CO4	Implement various selection tests	3	3	3	3	3
	CO5	Conduct different types of interviews	3	1	3	3	3



	20MBAPE310	M: Consumer Behaviour	3.00	3.00	0.80	3.00	2.60
	CO1	analyze consumer behavior.	3	3	1	3	3
	CO2	assess consumer environment	3	3	0	3	3
	CO3	measure consumer behavior	3	3	1	3	3
	CO4	evaluate consumer decision making process	3	3	0	3	3
	CO5	identify roots of consumerism and marketing ethics	3	3	2	3	1
5		Core Elective-2					
	20MBAPE302	E: Family Business Management	3.00	3.00	2.80	3.00	2.60
	CO1	Illustrate theories of family business	3	3	3	3	3
	CO2	Identify issues and challenges in business	3	3	2	3	2
	CO3	Compare leadership, succession and continuity	3	3	3	3	3
	CO4	Evaluate competitive advantage & lifecycle strategies	3	3	3	3	2
	CO5	Assess organization change and manage change	3	3	3	3	3
	20MBAPE305	F: Security Analysis & Portfolio Management	3.00	3.00	0.40	3.00	1.00
	CO1	analyze investment environment	3	3	1	3	3
	CO2	construct optimum portfolio	3	3	0	3	0
	CO3	compare equity valuation models	3	3	0	3	0
	CO4	choose different bond valuation methods	3	3	0	3	0
	CO5	evaluate MF I portfolio	3	3	1	3	2
	20MBAPE308	H: Learning, Training & Development	3.00	2.00	3.00	3.00	3.00
	CO1	apply theories of learning	3	0	3	3	3
	CO2	design a strategic training program	3	3	3	3	3
	CO3	appraise different methods of training	3	3	3	3	3
	CO4	assess effectiveness of EDP/MDP	3	3	3	3	3
	CO5	analyze career development issues	3	1	3	3	3
	20MBAPE311	M: Retailing Management	3.00	3.00	1.20	3.00	1.80
	CO1	identify trends in Indian retail markets	3	3	1	3	1
	CO2	evaluate shopping environment in cultural context	3	3	2	3	1
	CO3	apply various retail functions in real life situations	3	3	2	3	3
	CO4	analyze retail logistics	3	3	0	3	3
	CO5	assess buyers behavior and merchandise assortment plans	3	3	1	3	1
6		Core Elective-3					
	20MBAPE303	E: MSME & Management of NGOs	3.00	3.00	0.80	3.00	1.20
	CO1	interpret SME environment	3	3	1	3	1
	CO2	choose appropriate methods of project finance	3	3	0	3	2
	CO3	analyze MSME revival policies	3	3	0	3	1
	CO4	illustrate management of NGOs	3	3	0	3	1
	CO5	assess strategies of financing social enterprises	3	3	3	3	1
	20MBAPE306	F: Financial Derivatives	3.00	2.00	0.40	3.00	0.40
	CO1	illustrate scope and evils of derivatives	3	1	0	3	0
	CO2	apply mechanics of trading in futures & forward markets	3	3	2	3	2
	CO3	evaluate an option and implement hedging strategies	3	3	0	3	0
	CO4	classify commodities market derivatives and exchanges	3	1	0	3	0
	CO5	assess swaps in light of risk minimization	3	2	0	3	0
	20MBAPE309	H: Compensation and Reward Management	3.00	2.00	2.00	3.00	1.20
	CO1	identify pay model strategy	3	3	3	3	3
	CO2	assess competitiveness and design pay mix	3	2	2	3	1
	CO3	appraise benefits determination process	3	2	2	3	1
	CO4	classify special groups compensation	3	2	2	3	1
	CO5	outline legal provisions for pay fixation	3	1	1	3	0
	20MBAPE312	M: Services Marketing	3.00	1.00	2.20	3.00	1.80
	CO1	classify marketing of services	3	0	3	3	3
	CO2	identify consumer attitude	3	3	3	3	2
	CO3	illustrate innovative services	3	0	3	3	0
	CO4	classify deliverables in service	3	1	1	3	3
	CO5	appreciate services mix	3	1	1	3	1
7	20MBAPC303	Computer Applications to Business Practice	3.00	3.00	0.40	0.40	0.40



	CO1	illustrate Databases system concepts	3	3	1	1	1	
	CO2	make use of PL/SQL commands.	3	3	0	0	0	
	CO3	analyze various DML and DDL commands	3	3	0	0	0	
	CO4	construct ER diagrams with its characteristics	3	3	0	0	0	
	CO5	demonstrate various applications of DBMS	3	3	1	1	1	
8	20MBAPR301	Fieldwork/Summer Internship	3.00	3.00	2.80	2.60	2.60	
	CO1	analyze employee and employer psychology at workplace	3	3	3	3	3	
	CO2	identify managerial skills required at the job	3	3	2	3	1	
	CO3	apply professional management and administration	3	3	3	3	3	
	CO4	interpret managerial responsibilities and ethics in practice	3	3	3	3	3	
	CO5	familiarize various functional processes	3	3	3	1	3	
II-MBA-II-Semester (IV-Semester)								
No.	Subject Code	Subject Title	PO-1	PO-2	PO-3	PO-4	PO-5	
1	20MBAPC401	Business Ethics & Corporate Governance	3.00	0.80	3.00	3.00	3.00	
	CO1	relate ethics in governance	3	0	3	3	3	
	CO2	apply ethics in career	3	0	3	3	3	
	CO3	build ethical cybernetics	3	2	3	3	3	
	CO4	evaluate governance practices	3	1	3	3	3	
	CO5	develop transparent governance	3	1	3	3	3	
2	20MBAPC402	ERP & MIS	3.00	3.00	1.20	1.80	2.00	
	CO1	classify information systems	3	3	1	3	2	
	CO2	illustrate ERP	3	3	0	1	1	
	CO3	assess MIS	3	3	1	1	3	
	CO4	build information system	3	3	1	1	3	
	CO5	interpret cyber crimes	3	3	3	3	1	
3		Open Elective-2						
	20MBAOE401	R-Programming	3.00	3.00	0.00	0.00	0.00	
	CO1	explain concepts of R programming	3	3	0	0	0	
	CO2	illustrate structure of R programming	3	3	0	0	0	
	CO3	implement math functions and simulations in R programming	3	3	0	0	0	
	CO4	draw graphs using R programming	3	3	0	0	0	
	CO5	solve probability distribution problem through R programming	3	3	0	0	0	
	20MBAOE402	Business Analytics	3.00	3.00	0.20	1.40	1.40	
	CO1	explain concepts of business analytics	3	3	0	3	1	
	CO2	illustrate descriptive analytics	3	3	0	1	0	
	CO3	compare predictive and prescriptive analytics	3	3	0	0	0	
	CO4	identify the applications of DWDW	3	3	0	0	3	
	CO5	analyze importance of big data application to business	3	3	1	3	3	
	20MBAOE403	Non-Conventional Energy sources	3.00	1.40	0.40	3.00	1.40	
	CO1	analyze global and national energy scenarios	3	2	1	3	1	
	CO2	illustrate the various solar energy systems	3	1	0	3	0	
	CO3	demonstrate the aspects related to wind energy power plants	3	1	0	3	0	
	CO4	build the power plants using biogas	3	0	0	3	3	
	CO5	estimate the power generation in hydroelectric plants	3	3	1	3	3	
	20MBAOE404	Project Management	3.00	3.00	1.20	3.00	3.00	
	CO1	build project teams and organization culture	3	3	3	3	3	
	CO2	design appropriate project plan	3	3	0	3	3	
	CO3	execute projects	3	3	0	3	3	
	CO4	lead projects with teams	3	3	0	3	3	
	CO5	evaluate project performance	3	3	3	3	3	
4		Core Elective-4						
	20MBAPE401	E: Entrepreneurial Finance & Marketing	3.00	1.80	1.80	3.00	0.60	
	CO1	explain methods of financing entrepreneurs	3	0	1	3	0	
	CO2	illustrate venture evaluation and finance mix	3	3	3	3	1	
	CO3	identify techniques of financing	3	0	1	3	0	
	CO4	assess growth strategies	3	3	1	3	1	



	CO5	build marketing strategies	3	3	3	3	1
	20MBAPE404	F: Management Accounting	3.00	2.60	1.20	3.00	0.80
	CO1	demonstrate cost elements	3	2	1	3	0
	CO2	apply techniques of costing	3	2	1	3	2
	CO3	make use of marginal costing for effective decision making	3	3	3	3	2
	CO4	interpret various budgeting techniques	3	3	1	3	0
	CO5	summarize statements sources and uses of funds	3	3	0	3	0
	20MBAPE407	H: Management of Industrial Relations	3.00	1.20	3.00	3.00	1.00
	CO1	adapt provisions of IR policies of any economy	3	2	3	3	1
	CO2	analyze collective bargaining methods	3	2	3	3	1
	CO3	illustrate types and levels of tripartism	3	0	3	3	1
	CO4	make use of labor laws for healthy HR relations	3	1	3	3	1
	CO5	assess dispute settlement and redressal mechanism	3	1	3	3	1
	20MBAPE410	M: Digital Marketing	3.00	1.40	1.00	3.00	1.60
	CO1	illustrate digital marketing	3	0	0	3	0
	CO2	select distribution channels	3	1	1	3	3
	CO3	develop a strategic plan	3	3	3	3	3
	CO4	classify appropriate search engines	3	1	0	3	0
	CO5	analyze social media marketing	3	2	1	3	2
5		Core Elective-5					
	20MBAPE402	E: WTO & IPR	3.00	0.60	0.20	3.00	0.80
	CO1	compare GATT & WTO agreements	3	0	0	3	0
	CO2	illustrate WTO conventions	3	1	0	3	0
	CO3	identify legal framework for patents	3	1	1	3	0
	CO4	distinguish designs & GIS	3	1	0	3	3
	CO5	differentiate trademarks and copyrights	3	0	0	3	1
	20MBAPE405	F: Corporate Restructuring & Valuation	3.00	1.80	1.20	3.00	0.40
	CO1	illustrate the process of corporate valuation	3	0	3	3	0
	CO2	identify suitable M & A strategies	3	3	1	3	1
	CO3	assess mergers and acquisitions under various methods	3	3	2	3	1
	CO4	conduct EBIT-EPS analysis for enterprises	3	3	0	3	0
	CO5	predict different types of takeovers	3	0	0	3	0
	20MBAPE408	H: Performance Management Systems	3.00	1.80	2.60	3.00	1.40
	CO1	identify process of PMS	3	0	3	3	3
	CO2	appraise the performance parameters	3	3	3	3	0
	CO3	assess employee performance	3	3	3	3	1
	CO4	analyze legal issues in pay fixation	3	1	1	3	0
	CO5	adapt best practices in performance management	3	2	3	3	3
	20MBAPE411	M: Advertising, Sales Promotion & Distribution Mgt.	3.00	2.40	2.00	3.00	2.00
	CO1	illustrate various advertising methods	3	0	3	3	0
	CO2	identify appropriate media for advertising effectiveness	3	3	1	3	1
	CO3	develop a sales management plan	3	3	0	3	3
	CO4	apply promotion mix strategies	3	3	3	3	3
	CO5	design a suitable distribution channel	3	3	3	3	3
6		Core Elective-6					
	20MBAPE403	E: Creativity & Innovation	3.00	0.60	2.00	3.00	1.40
	CO1	elaborate creativity	3	0	3	3	0
	CO2	identify techniques of creativity	3	0	0	3	0
	CO3	assess creative intelligence	3	1	3	3	3
	CO4	evaluate innovations	3	1	3	3	3
	CO5	analyze perspectives of innovation	3	1	1	3	1
	20MBAPE406	F: Global Financial Management	3.00	0.40	0.20	3.00	0.60
	CO1	demonstrate international business methods	3	0	0	3	1
	CO2	explain various components of international funds flow	3	1	0	3	0
	CO3	illustrate structure and functions of Forex market	3	0	0	3	1
	CO4	identify factors influencing Forex rate movement	3	1	1	3	0
	CO5	interpret IFM functions	3	0	0	3	1

	20MBAPE409	H: Global Human Resource Management	3.00	0.20	2.40	3.00	1.00
	CO1	apply basics of IHRM	3	0	3	3	0
	CO2	appraise IHRM practices	3	0	3	3	0
	CO3	perceive virtual organization	3	0	3	3	3
	CO4	illustrate HR models	3	1	0	3	1
	CO5	assess impact of global issues	3	0	3	3	1
	20MBAPE412	M: Global Marketing Management	3.00	1.80	1.40	3.00	0.80
	CO1	illustrate international marketing	3	0	0	3	0
	CO2	identify & scan global market environment	3	3	3	3	1
	CO3	assess global market opportunities	3	3	3	3	1
	CO4	list global marketing strategies	3	0	0	3	0
	CO5	select global marketing channels	3	3	1	3	2
7	20MBAPR401	Project	3.00	3.00	2.40	2.80	2.20
	CO1	identify problem and formulate hypotheses	3	3	3	3	2
	CO2	develop and canvass questionnaire with suitable scale	3	3	3	3	3
	CO3	originate cross tables for data	3	3	0	2	1
	CO4	conduct tests and draw inferences	3	3	3	3	3
	CO5	prepare and present a project report	3	3	3	3	2



Department of Master of Business Administration (MBA)(R22)

MANAGEMENT AND ORGANIZATIONAL BEHAVIOR

Course	MBA I Semester	L	T	P	C
Subject Code	22MBAPC11	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate various schools of thought of management	3	3	3	3	3	3	3
CO2	analyse the process of planning and decision making	3	3	3	3	3	3	3
CO3	utilize functions of management in real life situations	3	3	3	3	3	3	3
CO4	interpret the group dynamics of any organisation	3	1	3	3	3	3	3
CO5	explain theories motivation and styles of leadership	3	3	3	3	3	3	3

BUSINESS ECONOMICS

Course	MBA I Semester	L	T	P	C
Subject Code	22MBAPC12	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	apply the principles of business economics	3	3	1	3	3	3	3
CO2	estimate the demand and supply functions to fit trend	3	3	3	3	3	3	3
CO3	illustrate input-output relations and CVP analysis	3	3	1	3	3	3	3
CO4	identify price-output decisions in various situations	3	1	3	3	1	3	3
CO5	interpret methods of pricing and strategies involved	3	3	1	3	2	3	3

FINANCIAL REPORTING AND ANALYSIS

Course	MBA I Semester	L	T	P	C
Subject Code	22MBAPC13	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate concepts, process and functions of accounting	3	1	3	3	3	3	3
CO2	apply accounting functions to prepare final accounts	3	3	1	3	1	3	3
CO3	interpret various models/methods of evaluation of assets	3	3	3	3	1	3	3
CO4	estimate sources and uses of funds and cash	3	3	1	3	1	3	3
CO5	analyse financial performance of the enterprise	3	3	3	3	1	3	3



RESEARCH METHODOLOGY AND STATISTICAL ANALYSIS

Course	MBA I Semester	L	T	P	C
Subject Code	22MBAPC14	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline the objectives, scope and process of research	3	3	2	3	2	3	3
CO2	illustrate research design and measurement scales	3	3	2	3	1	3	3
CO3	interpret various parametric and non-parametric tests	3	3	3	3	1	3	3
CO4	summarise ANOVA, correlation and regression	3	3	3	3	1	3	3
CO5	estimate index numbers and fit trend under TSA	3	3	2	3	1	3	3

LEGAL AND BUSINESS ENVIRONMENT

Course	MBA I Semester	L	T	P	C
Subject Code	22MBAPC15	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline importance provisions of Indian companies act	3	3	3	3	3	3	3
CO2	apply contract laws for offer, acceptance and remedy	3	3	3	3	3	3	3
CO3	illustrate provisions under negotiable instruments act	3	3	3	3	3	3	3
CO4	analyse micro and macro business environment	3	3	2	3	2	3	3
CO5	relate provisions of business regulations & environment	3	3	1	3	1	3	3

BUSINESS ETHICS AND CORPORATE GOVERNANCE (OPEN ELECTIVE - I)

Course	MBA I Semester	L	T	P	C
Subject Code	22MBAOE11	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	understand business ethics and corporate governance	3	3	3	3	3	3	3
CO2	apply corporate governance and ethics to business	3	1	2	3	3	3	3
CO3	illustrate professional code and rationale behind code	3	3	3	3	2	3	3
CO4	outline the role of board in corporate governance	3	1	2	3	2	3	3
CO5	assess corporate governance in light of stakeholders	3	3	1	3	1	3	3

PROJECT MANAGEMENT (OPEN ELECTIVE - I)

Course	MBA I Semester	L	T	P	C
Subject Code	22MBAOE12	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate the process of project management	3	3	3	3	3	3	3
CO2	assess and rank various projects for their feasibility	3	3	3	3	3	3	3
CO3	estimate project cash flows and sources of financing	3	3	3	3	3	3	3
CO4	apply project management and controlling techniques	3	3	3	3	3	3	3
CO5	classify behavioral issues in project organizations	3	3	3	3	3	3	3

SUSTAINABILITY MANAGEMENT (OPEN ELECTIVE – I)

Course	MBA I Semester	L	T	P	C
Subject Code	22MBAOE13	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	identify need for sustainability and development	3	3	3	3	3	3	3
CO2	illustrate environment and economic sustainability	3	3	3	3	3	3	3
CO3	assess the process sustainability and its strategies	3	3	3	3	3	3	3
CO4	apply methods of value creation & value systems	3	3	3	3	3	3	3
CO5	analyse the benefits of market sustainability process	3	3	3	3	3	3	3

CROSS CULTURAL MANAGEMENT (OPEN ELECTIVE – I)

Course	MBA I Semester	L	T	P	C
Subject Code	22MBAOE14	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline various types of cultural determinants	3	3	3	3	3	3	3
CO2	illustrate cultural dilemmas the dimensions	3	3	3	3	3	3	3
CO3	assess leadership influence in cross cultural organisation	3	3	3	3	3	3	3
CO4	identify cross-cultural barriers in communication	3	3	3	3	3	3	3
CO5	infer cross-cultural influence on conflict management	3	3	3	3	3	3	3

BUSINESS COMMUNICATION LAB

Course	MBA I Semester	L	T	P	C
Subject Code	22MBAPR11	-	-	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline various communication barriers	3	2	3	3	3	3	3
CO2	improve RAWL skills for effective team player	3	1	3	3	3	3	3
CO3	illustrate features of effective report	3	2	3	3	3	3	3
CO4	apply traits in individual communication and teams	3	1	3	3	3	3	3
CO5	assess impact of ICT tools and professional etiquette	3	1	3	3	3	3	3



STATISTICAL DATA ANALYSIS LAB

Course	MBA I Semester	L	T	P	C
Subject Code	22MBAPR12	-	-	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate important tools in of MS- Excel /SPSS.	3	3	1	3	1	3	3
CO2	make use of excel tools for data analytics	3	3	2	3	2	3	3
CO3	outline various pictorial tools to present data	3	3	3	3	3	3	3
CO4	implement test-statistic to draw inference	3	3	3	3	3	3	3
CO5	apply different parametric/non-parametric tests	3	3	3	3	3	3	3

HUMAN RESOURCE MANAGEMENT

Course	MBA II Semester	L	T	P	C
Subject Code	22MBAPC21	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline responsibilities, approaches and HR analytics	3	3	3	3	3	3	3
CO2	implement the process of recruitment and selection	3	3	3	3	3	3	3
CO3	illustrate the process of training and career development	3	3	3	3	3	3	3
CO4	identify features of employee compensation & welfare	3	3	3	3	3	3	3
CO5	assess employee relations at work place	3	3	3	3	3	3	3

MARKETING MANAGEMENT

Course	MBA II Semester	L	T	P	C
Subject Code	22MBAPC22	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline concepts and approaches to marketing	3	3	3	3	3	3	3
CO2	analyse market mix strategies for customer value	3	3	3	3	3	3	3
CO3	design a customer driven strategy for segmentation	3	3	3	3	3	3	3
CO4	illustrate various distribution and promotional strategies	3	3	3	3	3	3	3
CO5	explain various price & promotion mix strategies	3	3	3	3	3	3	3

FINANCIAL MANAGEMENT

Course	MBA II Semester	L	T	P	C
Subject Code	22MBAPC23	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	interpret objectives & functions of financial management	3	3	1	3	3	3	3
CO2	illustrate cost of capital and capital budgeting decisions	3	3	1	3	1	3	3
CO3	identify ideal capital structure for an organisation	3	3	1	3	1	3	3

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CO4	apply various theories of dividend to assess value of firm	3	3	1	3	1	3	3
CO5	analyse management and valuation of current assets	3	3	3	3	1	3	3

QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS

Course	MBA II Semester	L	T	P	C
Subject Code	22MBAPC24	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	interpret various techniques of operations research.	3	3	2	3	1	3	3
CO2	solve LPP and find primal and dual for a given LPP	3	3	2	3	1	3	3
CO3	illustrate process of assignment and transport problems	3	3	2	3	1	3	3
CO4	apply decision making models towards optimization	3	3	2	3	1	3	3
CO5	appraise decision making by queuing & games theories	3	3	2	3	1	3	3

ENTREPRENEURSHIP AND DESIGN THINKING

Course	MBA II Semester	L	T	P	C
Subject Code	22MBAPC25	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	analyse role, approaches, and types of entrepreneurship	3	3	3	3	3	3	3
CO2	illustrate strategic perspectives of an entrepreneur	3	3	3	3	3	3	3
CO3	assess entrepreneurial opportunities and challenges	3	3	3	3	3	3	3
CO4	implement principles of design thinking	3	3	3	3	3	3	3
CO5	prepare DPR and prototype to scale-up commercially	3	3	3	3	3	3	3

LOGISTICS & SUPPLY CHAIN MANAGEMENT

Course	MBA II Semester	L	T	P	C
Subject Code	22MBAPC26	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate logistics and supply chain management	3	3	3	3	3	3	3
CO2	identify various components & functions in logistics	3	3	3	3	3	3	3
CO3	analyse the problems in supply chain issues	3	3	3	3	3	3	3
CO4	assess the supply chain performance	3	3	3	3	3	3	3
CO5	summarise supply chain selection and coordination	3	3	3	3	3	3	3



TOTAL QUALITY MANAGEMENT (OPEN ELECTIVE – II)

Course	MBA II Semester	L	T	P	C
Subject Code	22MBAOE21	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline TQM objectives, need and limitations	3	3	3	3	3	3	3
CO2	implement principles of TQM	3	3	3	3	3	3	3
CO3	illustrate statistical process control	3	3	3	3	3	3	3
CO4	analyse contemporary advancements in TQM	3	3	3	3	3	3	3
CO5	conduct quality audit by following latest ISO series	3	3	3	3	3	3	3

MARKETING RESEARCH (OPEN ELECTIVE – II)

Course	MBA II Semester	L	T	P	C
Subject Code	22MBAOE22	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate various marketing research methods	3	3	3	3	3	3	3
CO2	design a research programme	3	3	3	3	3	3	3
CO3	implement sampling techniques for data collection	3	3	3	3	3	3	3
CO4	identify suitable measurement, scaling and sampling	3	3	3	3	3	3	3
CO5	analyse testing of hypotheses to draw conclusions	3	3	3	3	3	3	3

INTERNATIONAL BUSINESS (OPEN ELECTIVE – II)

Course	MBA II Semester	L	T	P	C
Subject Code	22MBAOE23	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline IB concepts, principles and approaches	3	3	3	3	3	3	3
CO2	illustrate various international trade theories	3	3	3	3	3	3	3
CO3	assess need for integration of IB with economy	3	3	3	3	3	3	3
CO4	identify strategy and structure for IB	3	3	3	3	3	3	3
CO5	assess the challenges and issues in IB operations	3	3	3	3	3	3	3

RURAL MARKETING (OPEN ELECTIVE – II)

Course	MBA II Semester	L	T	P	C
Subject Code	22MBAOE24	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline avenues for rural markets in Indian economy	3	3	3	3	3	3	3
CO2	identify ingredients for rural marketing mix	3	3	3	3	3	3	3
CO3	illustrate market mix issues & challenges in rural areas	3	3	3	3	3	3	3
CO4	conduct rural business & social market research	3	3	3	3	3	3	3
CO5	outline innovative methods of rural market research	3	3	3	3	3	3	3

PRODUCTION & OPERATIONS MANAGEMENT

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPC31	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate systems production/operations management	3	3	1	3	1	3	3
CO2	conduct product and process design, analysis	3	3	2	3	1	3	3
CO3	assess for suitable plant location and layout	3	3	2	3	1	3	3
CO4	identify the need for scheduling and prepare a schedule	3	3	2	3	1	3	3
CO5	implement techniques inventory control	3	3	2	3	1	3	3

MANAGEMENT INFORMATION SYSTEMS

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPC32	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	identify the merits of strategic MIS	3	3	3	3	3	3	3
CO2	outline business applications of information systems	3	3	1	3	3	3	3
CO3	examine the MIS effectiveness	3	3	1	3	3	3	3
CO4	develop phase wise MIS for an enterprise	3	3	2	3	3	3	3
CO5	analyse security attacks and cyber crime	3	3	2	3	3	3	3

BUSINESS ANALYTICS

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPC33	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline techniques of business analytics in real life	3	3	3	3	3	3	3
CO2	employ descriptive statistics in data modelling	3	3	3	3	3	3	3
CO3	apply various tools/techniques in predictive analytics	3	3	3	3	3	3	3
CO4	illustrate the aspects data mining	3	3	3	3	3	3	3
CO5	apply simulation techniques to mitigate compute risks	3	3	3	3	3	3	3



DIGITAL MARKETING (PROFESSIONAL ELECTIVE-I)

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPE31M	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline various digital marketing methods in business	3	3	3	3	3	3	3
CO2	identify digital marketing channels	3	3	3	3	3	3	3
CO3	develop digital marketing plan	3	3	3	3	3	3	3
CO4	use search engine marketing & online marketing tools	3	3	3	3	3	3	3
CO5	assess the need for social media marketing	3	3	3	3	3	3	3

TALENT AND PERFORMANCE MANAGEMENT SYSTEMS (PROFESSIONAL ELECTIVE-I)

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPE31H	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate the core competence of TM	3	3	3	3	3	3	3
CO2	implement competency based TM	3	3	3	3	3	3	3
CO3	conduct a performance management program	3	3	3	3	3	3	3
CO4	identify KPI/KRA/KSF for PMS effectiveness	3	3	3	3	3	3	3
CO5	relate employee development reward and legal systems	3	3	3	3	3	3	3

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT (PROFESSIONAL ELECTIVE-I)

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPE31F	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	examine the Indian financial system and environment	3	3	-	3	-	3	3
CO2	develop an optimum & minimum variance portfolio	3	3	-	3	-	3	3
CO3	determine bond convexity, duration and immunisation	3	3	1	3	1	3	3
CO4	illustrate various equity evaluation models	3	3	1	3	1	3	3
CO5	explain various models for MFIs and derivatives	3	3	1	3	1	3	3

START-UP AND MSME MANAGEMENT (PROFESSIONAL ELECTIVE-I)

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPE31E	4	0	0	4



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline various Start-up opportunities	3	3	3	3	3	3	3
CO2	identify requirements for start-ups and challenges	3	3	3	3	3	3	3
CO3	illustrate SWOT process for new start-ups	3	3	3	3	3	3	3
CO4	analyse the challenges in management of MSMEs	3	3	3	3	3	3	3
CO5	assess institutional support & assistance to MSMEs	3	3	3	3	3	3	3

**SALES AND PROMOTION MANAGEMENT
(PROFESSIONAL ELECTIVE-II)**

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPE32M	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate the process of sales promotion management	3	3	3	3	3	3	3
CO2	outline different promotional-mix strategies	3	3	3	3	3	3	3
CO3	apply various methods for effective sale management	3	3	3	3	3	3	3
CO4	develop sales promotion plan and strategies	3	3	3	3	3	3	3
CO5	assess performance of place-mix for various products	3	3	3	3	3	3	3

**LEARNING AND DEVELOPMENT
(PROFESSIONAL ELECTIVE-II)**

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPE32H	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	classify different learning theories	3	3	3	3	3	3	3
CO2	design a employee-training strategy through TNA	3	3	3	3	3	3	3
CO3	illustrate employee training methods at all levels	3	3	3	3	3	3	3
CO4	prepare employee career development plan	3	3	3	3	3	3	3
CO5	assess contemporary learning & development practices	3	3	3	3	3	3	3

**RISK MANAGEMENT AND FINANCIAL DERIVATIVES
(PROFESSIONAL ELECTIVE-II)**

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPE32F	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline tools to detect risk and manage suitably	3	3	3	3	3	3	3
CO2	illustrate different risk measurement/assessment tools	3	3	3	3	3	3	3
CO3	identify the spread of derivative markets and products	3	3	3	3	3	3	3

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CO4	analyse risk management through option strategies	3	3	3	3	3	3	3
CO5	assess risk involved through swaps and swap-options	3	3	3	3	3	3	3

TECHNOLOGY BUSINESS INCUBATION (PROFESSIONAL ELECTIVE-II)

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPE32E	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline objectives, need and importance of TBIs	3	3	3	3	3	3	3
CO2	develop a TBI that fit for a scheduled or notified area	3	3	3	3	3	3	3
CO3	identify the evaluation process for TBI	3	3	3	3	3	3	3
CO4	assess the challenges in establishment of TBIs	3	3	3	3	3	3	3
CO5	illustrate global trends in establishing TBIs	3	3	3	3	3	3	3

CONSUMER BEHAVIOR (PROFESSIONAL ELECTIVE-III)

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPE33M	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	identify the need for assessment of consumer behaviour	3	3	3	3	3	3	3
CO2	interpret consumer behaviour and factors of influence	3	3	3	3	3	3	3
CO3	conduct a consumer perception analysis and draft report	3	3	3	3	3	3	3
CO4	illustrate process of consumer decision making process	3	3	3	3	3	3	3
CO5	assess the consumerism in light of unfair practices	3	3	3	3	3	3	3

EMPLOYEE RELATIONS (PROFESSIONAL ELECTIVE-III)

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPE33H	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	identify legislative provisions in India for employees	3	3	3	3	3	3	3
CO2	illustrate the collective bargaining process	3	3	3	3	3	3	3
CO3	outline the remedies in bipartite/tripartite agreements	3	3	3	3	3	3	3
CO4	apply legal provisions for a better employee relations	3	3	3	3	3	3	3
CO5	interpret legal provisions for settlement of labour issues	3	3	3	3	3	3	3



STRATEGIC COST AND MANAGEMENT ACCOUNTING (PROFESSIONAL ELECTIVE-III)

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPE33F	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline various techniques of cost analysis and control	3	3	3	3	3	3	3
CO2	illustrate significance of costing in decision making	3	3	3	3	3	3	3
CO3	solve problems based on CVP & ABC methods	3	3	3	3	3	3	3
CO4	analyze various methods & techniques of budgeting	3	3	3	3	3	3	3
CO5	asses variance costing technique in decision making	3	3	3	3	3	3	3

INNOVATION AND ENTREPRENEURSHIP (PROFESSIONAL ELECTIVE-III)

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPE33E	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate the creativity phenomenon	3	3	3	3	3	3	3
CO2	outline the process of creative problem solving	3	3	3	3	3	3	3
CO3	identify creative intelligence and use of decision making	3	3	3	3	3	3	3
CO4	make use of innovation management practices	3	3	3	3	3	3	3
CO5	conduct SWOT analysis for global innovation	3	3	3	3	3	3	3

SUMMER INTERNSHIP

Course	MBA III Semester	L	T	P	C
Subject Code	22MBAPR31	0	0	2	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	interpret management functions and functional areas	3	3	3	3	3	3	3
CO2	identify OFC for a given undertaking with hierarchy	3	3	3	3	3	3	3
CO3	apply functional knowledge to businesses enterprises	3	3	3	3	3	3	3
CO4	conduct organisational overall performance analysis	3	3	3	3	3	3	3
CO5	prepare detailed report on organisational performance	3	3	3	3	3	3	3

STRATEGIC MANAGEMENT

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPC41	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
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CO1	illustrate the strategic management process	3	3	3	3	3	3	3
CO2	identify techniques of strategic performance analysis	3	3	3	3	3	3	3
CO3	implement strategic planning programme suitably	3	3	3	3	3	3	3
CO4	compare turnaround and diversification strategies	3	3	3	3	3	3	3
CO5	organise strategy evaluation and control programme	3	3	3	3	3	3	3

INTERNATIONAL MARKETING (PROFESSIONAL ELECTIVE-IV)

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPE41M	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline the trends of global marketing management	3	3	3	3	3	3	3
CO2	identify global environment growth drivers	3	3	3	3	3	3	3
CO3	illustrate the needs/requirements of global customers	3	3	3	3	3	3	3
CO4	apply marketing mix strategies globally	3	3	3	3	3	3	3
CO5	conduct global negotiations and documentation	3	3	3	3	3	3	3

INTERNATIONAL HUMAN RESOURCE MANAGEMENT (PROFESSIONAL ELECTIVE-IV)

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPE41H	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline features of IHRM	3	3	3	3	3	3	3
CO2	illustrate knowledge transfer process in MNCs	3	3	3	3	3	3	3
CO3	identify the steps in GHRP	3	3	3	3	3	3	3
CO4	develop a global TNA programme and schedule	3	3	3	3	3	3	3
CO5	prepare global performance appraisal report	3	3	3	3	3	3	3

INTERNATIONAL FINANCIAL MANAGEMENT (PROFESSIONAL ELECTIVE-IV)

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPE41F	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	compare IFM with that of financial management	3	3	3	3	3	3	3
CO2	illustrate international flow of funds & monetary system	3	3	3	3	3	3	3
CO3	outline features of foreign exchange market	3	3	3	3	3	3	3
CO4	analyse various international exchange rates	3	3	3	3	3	3	3
CO5	prepare an asset liability management report	3	3	3	3	3	3	3

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ENTREPRENEURIAL FINANCE (PROFESSIONAL ELECTIVE-IV)

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPE41E	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline various avenues for enterprise financing	3	3	3	3	3	3	3
CO2	identify process for organising and operating the venture	3	3	3	3	3	3	3
CO3	illustrate the process of financial planning	3	3	3	3	3	3	3
CO4	analyse the mechanics of venture valuation	3	3	3	3	3	3	3
CO5	employ venture capital financing for growing venture	3	3	3	3	3	3	3

SERVICES MARKETING (PROFESSIONAL ELECTIVE-V)

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPE42M	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	explain the need and objectives of services marketing	3	3	3	3	3	3	3
CO2	illustrate the process of focusing on consumer	3	3	3	3	3	3	3
CO3	identify the need for service innovation and excellence	3	3	3	3	3	3	3
CO4	analyse service process and service-firms integration	3	3	3	3	3	3	3
CO5	assess the importance of managing of service promises	3	3	3	3	3	3	3

LEADERSHIP AND CHANGE MANAGEMENT (PROFESSIONAL ELECTIVE-V)

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPE42H	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	explain various approaches to leadership	3	3	3	3	3	3	3
CO2	illustrate different theories and styles leadership	3	3	3	3	3	3	3
CO3	analyse the organisational change and role of leader	3	3	3	3	3	3	3
CO4	prepare a plan to manage & arrest resistance to change	3	3	3	3	3	3	3
CO5	assess the strategic organisational change for OD	3	3	3	3	3	3	3

STRATEGIC FINANCIAL MANAGEMENT (PROFESSIONAL ELECTIVE-V)

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPE42F	4	0	0	4



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline the process of financial strategy and planning	3	3	3	3	3	3	3
CO2	identify investment decisions under risk and uncertainty	3	3	3	3	3	3	3
CO3	apply modern techniques to rank the best projects	3	3	3	3	3	3	3
CO4	assess the value of firm by through capital structure	3	3	3	3	3	3	3
CO5	illustrate various approaches mergers & acquisitions	3	3	3	3	3	3	3

ENTREPRENEURIAL MARKETING (PROFESSIONAL ELECTIVE-V)

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPE42E	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	identify marketing mix components that fits to start-up	3	3	3	3	3	3	3
CO2	develop a growth plan for an enterprise	3	3	3	3	3	3	3
CO3	implement growth strategies and models suitably	3	3	3	3	3	3	3
CO4	assess marketing developmental strategies and modify	3	3	3	3	3	3	3
CO5	analyse contemporary marketing practices and adoption	3	3	3	3	3	3	3

MARKETING ANALYTICS (PROFESSIONAL ELECTIVE-VI)

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPE43M	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

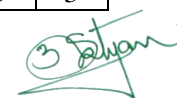
COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate significance marketing analytics	3	3	3	3	3	3	3
CO2	apply the data collection process and prepare report	3	3	3	3	3	3	3
CO3	develop pictorial presentation about consumer attributes	3	3	3	3	3	3	3
CO4	implement pricing analytics suitably	3	3	3	3	3	3	3
CO5	organise segmentation and promotion analytics	3	3	3	3	3	3	3

HR ANALYTICS (PROFESSIONAL ELECTIVE-VI)

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPE43H	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate the importance of big data analytics	3	3	3	3	3	3	3
CO2	apply workforce analytics appropriately	3	3	3	3	3	3	3



CO3	make use of MS Excel for Human Resource Systems	3	3	3	3	3	3	3
CO4	analyse descriptive statistics for HR applications	3	3	3	3	3	3	3
CO5	asses Predictive and Prescriptive Analytics in HR	3	3	3	3	3	3	3

FINANCIAL ANALYTICS (PROFESSIONAL ELECTIVE-VI)

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPE43F	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	outline techniques of financial statement analysis	3	3	3	3	3	3	3
CO2	apply MS Excel tools for financial modelling	3	3	3	3	3	3	3
CO3	illustrate how MS Excel helps in ranking of projects	3	3	3	3	3	3	3
CO4	conduct equity analysis through MS Excel	3	3	3	3	3	3	3
CO5	make use of MS Excel tools for bond valuation	3	3	3	3	3	3	3

FAMILY BUSINESS MANAGEMENT (PROFESSIONAL ELECTIVE-VI)

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPE43E	4	0	0	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	illustrate the types of family business opportunities	3	3	3	3	3	3	3
CO2	analyse the challenges of family ownership businesses	3	3	3	3	3	3	3
CO3	identify transfer of power requirements to successor	3	3	3	3	3	3	3
CO4	assess strategic planning in family business houses	3	3	3	3	3	3	3
CO5	interpret future of family business with professionalism	3	3	3	3	3	3	3

PROJECT PRE-SUBMISSION

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPR41	-	-	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	identify a problem and set objectives for the study	3	3	3	3	3	3	3
CO2	illustrate literature review process	3	3	3	3	3	3	3
CO3	outline research design, sampling type and test statistic	3	3	3	3	3	3	3
CO4	prepare a synopsis with future scope of proposed project	3	3	3	3	3	3	3
CO5	present synopsis and seek advice of experts	3	3	3	3	3	3	3



MAIN PROJECT

Course	MBA IV Semester	L	T	P	C
Subject Code	22MBAPR42	-	-	8	4

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2
CO1	test the objectives and support hypotheses	3	3	3	3	3	3	3
CO2	explain data collection process and develop cross tables	3	3	3	3	3	3	3
CO3	apply sampling techniques to support test statistic	3	3	3	3	3	3	3
CO4	analyze the data, draw meaningful inferences	3	3	3	3	3	3	3
CO5	prepare a report on summary, findings and conclusions	3	3	3	3	3	3	3

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (R22)

M.Tech. - Computer Science and Engineering (CSE)

M.Tech. - Academic Regulations - R22

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22CSPC11	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	construct precise propositional logic	3	3	3	3	3
CO2	use set theory to formulate precise statements	3	3	3	3	3
CO3	illustrate various recursive algorithms	3	3	3	3	3
CO4	adapt various probabilistic reasoning approaches	3	3	3	3	3
CO5	apply graph theory in solving computing problems	3	3	3	3	3

ADVANCED DATA STRUCTURES

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22CSPC12	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	analyze various heap data structures	3	3	3	3	3
CO2	illustrate various hashing and collision techniques	3	3	3	3	3
CO3	adapt various tree data structures	3	3	3	3	3
CO4	perceive digital search structures	3	3	3	3	3
CO5	apply various pattern matching algorithms	3	3	3	3	3



DATABASE PROGRAMMING WITH PL/SQL (Professional Elective-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22CSPE11	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	illustrate the basic building blocks of PL/SQL	3	3	3	3	3
CO2	use different control structures	3	3	3	3	3
CO3	demonstrate functions and procedures with arguments	3	3	3	3	3
CO4	interpret packages to reuse the functionality	3	3	3	3	3
CO5	make use of triggers and data manipulations	3	3	3	3	3

DEEP LEARNING (Professional Elective-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22CSPE12	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	adapt back propagation algorithms	3	3	3	3	3
CO2	outline convolutional neural networks for encoders	3	3	3	3	3
CO3	apply deep learning in computer vision and NLP	3	3	3	3	3
CO4	make use of deep learning in NLP	3	3	3	3	3
CO5	illustrate Analogy reasoning	3	3	3	3	3

NATURAL LANGUAGE PROCESSING (Professional Elective-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22CSPE13	3	0	0	3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	explain fundamentals of NLP and morphology	3	3	3	3	3
CO2	demonstrate word level statements and syntactic analysis	3	3	3	3	3
CO3	make use of context free grammar and parsing techniques	3	3	3	3	3
CO4	apply semantic analysis techniques to solve various problems	3	3	3	3	3
CO5	illustrate language generation and discourse analysis	3	3	3	3	3

**APPLIED CRYPTOGRAPHY
(Professional Elective-II)**

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22CSPE14	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	illustrate various protocols of cryptography	3	3	3	3	3
CO2	adapt various cryptographic techniques	3	3	3	3	3
CO3	elaborate public key algorithms and digital signatures	3	3	3	3	3
CO4	demonstrate digital signatures	3	3	3	3	3
CO5	analyze various real world approaches of cryptography	3	3	3	3	3

**SOFTWARE QUALITY ENGINEERING
(Professional Elective-II)**

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22CSPE15	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	demonstrate quality frameworks	3	3	3	3	3



CO2	elaborate various defect prevention and reduction techniques	3	3	3	3	3
CO3	analyze quality planning aspects as quality engineering process	3	3	3	3	3
CO4	adapt software quality through testing and automations processes	3	3	3	3	3
CO5	find coverage and usage testing through checklists and partitions	3	3	3	3	3

MINING MASSIVE DATASETS (Professional Elective-II)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22CSPE16	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	explain massive data using mapreduce	3	3	3	3	3
CO2	implement algorithms for data streaming	3	3	3	3	3
CO3	adapt link analysis to clustering	3	3	3	3	3
CO4	develop recommendation systems	3	3	3	3	3
CO5	make use of social networks in data mining	3	3	3	3	3

ADVANCED DATA STRUCTURES LAB

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22CSPC13	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	illustrate various search techniques	3	3	3	3	3
CO2	adapt various sorting techniques	3	3	3	3	3
CO3	implement various tree structures	3	3	3	3	3
CO4	demonstrate the kinds of heaps	3	3	3	3	3



CO5	solve pattern matching algorithms	3	3	3	3	3
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DATABASE PROGRAMMING WITH PL/SQL LAB (Professional Elective Lab-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22CSPE17	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	implement loops and control statements	3	3	3	3	3
CO2	demonstrate cursors	3	3	3	3	3
CO3	adapt various functions	3	3	3	3	3
CO4	implement of exception handling, packages	3	3	3	3	3
CO5	solve problems by using triggers and procedures	3	3	3	3	3

DEEP LEARNING LAB (Professional Elective Lab-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22CSPE18	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	model Spyder IDE environment	3	3	3	3	3
CO2	use keras, tensorflow and pytorch libraries	3	3	3	3	3
CO3	apply CNN and deep learning models	3	3	3	3	3
CO4	adapt sentiment analysis model and auto encoder algorithms	3	3	3	3	3
CO5	design generative adversarial networks	3	3	3	3	3



NATURAL LANGUAGE PROCESSING LAB
(Professional Elective Lab-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22CSPE19	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	examine word in NLP	3	3	3	3	3
CO2	test N-Grams in NLP	3	3	3	3	3
CO3	execute skip gram model using NLP	3	3	3	3	3
CO4	implement Hidden Markov Model	3	3	3	3	3
CO5	apply chunking in unstructured text	3	3	3	3	3

RESEARCH METHODOLOGY AND IPR
(Mandatory Course)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22MC11	2	0	0	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	formulate research problem	3	3	3	3	3
CO2	analyze research related information	3	3	3	3	3
CO3	follow research ethics	3	3	3	3	3
CO4	perceive nature of IPR and its development	3	3	3	3	3
CO5	outline the patent right	3	3	3	3	3

ENGLISH FOR RESEARCH PAPER WRITING
(Audit Course-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22AC11	2	0	0	0



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	write a technical report without any ambiguity & redundancy	3	3	3
CO2	illustrate how to criticize/highlight-findings avoid plagiarism	3	3	3
CO3	apply various techniques of research to discuss results	3	3	3
CO4	exhibit technical communication skills in documentation	3	3	3
CO5	demonstrate research/technical paper publication skills	3	3	3

**DISASTER MANAGEMENT
(Audit Course-I)**

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22AC12	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

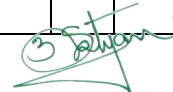
COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	analyze impact of disasters	3	3	3
CO2	choose suitable disaster management mechanism	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	3	3	3
CO4	develop strategies to cope up with disasters	3	3	3
CO5	build disaster management plan	3	3	3

**SANSKRIT FOR TECHNICAL KNOWLEDGE
(Audit Course-I)**

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22AC13	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	identify the alphabets	3	3	3



CO2	categorize past/present/future tenses	3	3	3
CO3	determine the roots of the language	3	3	3
CO4	relate the technical information about sanskrit language	3	3	3
CO5	articulate technical concepts of engineering	3	3	3

VALUE EDUCATION (Audit Course-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22AC14	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	interpret moral values, ethics, code of conduct and culture	3	3	3
CO2	illustrate humanity, honesty, devotion, confidence and patriotism	3	3	3
CO3	develop positive thinking, integrity and group cohesiveness	3	3	3
CO4	exhibit friendship, love for truth, and eco-friendly to environment	3	3	3
CO5	identify need for reincarnation, self-control and gender Equity	3	3	3

ADVANCED ALGORITHMS

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPC21	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	illustrate sorting and searching algorithms	3	3	3	3	3
CO2	apply matriods in graph matching	3	3	3	3	3
CO3	elaborate flow networks and matrix computations	3	3	3	3	3
CO4	perceive dynamic programming though discrete fourier transforms	3	3	3	3	3



CO5	explain problem solving paradigms	3	3	3	3	3
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ADVANCED COMPUTER ARCHITECTURE

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPC22	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	outline parallelism in various architectures	3	3	3	3	3
CO2	analyze metrics and measures of processor performance	3	3	3	3	3
CO3	illustrate pipeline processor designs	3	3	3	3	3
CO4	elaborate various generations of multicomputer	3	3	3	3	3
CO5	explain multi vector multi processors	3	3	3	3	3

ENTERPRISE CLOUD CONCEPTS (Professional Elective – III)

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPE21	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	explain cloud deployment models	3	3	3	3	3
CO2	illustrate cloud computing mechanisms	3	3	3	3	3
CO3	analyze cloud management mechanisms and architectures	3	3	3	3	3
CO4	apply cloud enabled smart enterprises	3	3	3	3	3
CO5	perceive cloud-instigated IT transformations	3	3	3	3	3



ADVANCED COMPUTER NETWORKS
(Professional Elective – III)

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPE22	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	demonstrate data link layer protocols	3	3	3	3	3
CO2	explain transport and application layer protocols	3	3	3	3	3
CO3	apply socket programming for web server	3	3	3	3	3
CO4	illustrate wireless mobile networks	3	3	3	3	3
CO5	elaborate multimedia networking	3	3	3	3	3

EDGE ANALYTICS
(Professional Elective – III)

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPE23	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	explain the concepts of edge analytics	3	3	3	3	3
CO2	analyze the communication protocols in edge analytics	3	3	3	3	3
CO3	deploy different cloud services	3	3	3	3	3
CO4	make use of micropython on edge analytics applications	3	3	3	3	3
CO5	illustrate types of attacks in edge analytics	3	3	3	3	3



BIO INFORMATICS (Professional Elective – IV)

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPE24	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	illustrate xml (bio xml) for bioinformatics	3	3	3	3	3
CO2	make use of perl (bioperl) for bioinformatics	3	3	3	3	3
CO3	perceive object-oriented databases	3	3	3	3	3
CO4	demonstrate sequence alignment algorithms	3	3	3	3	3
CO5	explain phylogenetic analysis	3	3	3	3	3

NATURE INSPIRED COMPUTING (Professional Elective – IV)

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPE25	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	explain the fundamentals of Nature Inspired Computing	3	3	3	3	3
CO2	develop programs using the concepts of Genetic Algorithms	3	3	3	3	3
CO3	make use of Swarm Intelligence and immunocomputing	3	3	3	3	3
CO4	show self-tuning algorithms	3	3	3	3	3
CO5	describe nature inspired computing for artificial life	3	3	3	3	3

ROBOTIC PROCESS AUTOMATION (Professional Elective – IV)

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPE26	3	0	0	3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	outline the basics of RPA	3	3	3	3	3
CO2	implement RPA	3	3	3	3	3
CO3	demonstrate RPA tools and automation techniques	3	3	3	3	3
CO4	adapt RPA BOT Models	3	3	3	3	3
CO5	execute Orchestrator	3	3	3	3	3

ADVANCED ALGORITHMS LAB

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPC23	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	illustrate assignment problem using dynamic programming	3	3	3	3	3
CO2	solve knapsack problem using the Greedy method	3	3	3	3	3
CO3	implement LU decomposition	3	3	3	3	3
CO4	adapt KMP algorithm	3	3	3	3	3
CO5	design programs based on max – flow problem	3	3	3	3	3

**ENTERPRISE CLOUD CONCEPTS LAB
(Professional Elective Lab-III)**

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPE27	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	install Virtualbox/VMware with linux or windows OS	3	3	3	3	3



CO2	execute programs with C compiler in any virtual machine	3	3	3	3	3
CO3	illustrate process of create hello-world and google engine apps	3	3	3	3	3
CO4	explain the file-transfer process from one VM to another	3	3	3	3	3
CO5	find the process for launch VM using trystack and Hadoop	3	3	3	3	3

ADVANCED COMPUTER NETWORKS LAB (Professional Elective Lab-III)

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPE28	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	identify the IP fragmentation and reassembly algorithm.	3	3	3	3	3
CO2	write IP forwarding algorithm and sliding window protocol	3	3	3	3	3
CO3	use switch/configure procedure to connect private IPs	3	3	3	3	3
CO4	install telnet in two systems and use wireshark application	3	3	3	3	3
CO5	explain Start packet capture in wireshark application	3	3	3	3	3

EDGE ANALYTICS LAB (Professional Elective Lab-III)

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPE29	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	identify the benefits of edge computing	3	3	3	3	3
CO2	develop the micro services in iofog	3	3	3	3	3
CO3	develop user defined services in the edge	3	3	3	3	3
CO4	create use cases in IoT with edge computing	3	3	3	3	3



CO5	develop services in MEC	3	3	3	3	3
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MINI PROJECT WITH SEMINAR

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22CSPR21	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	identify the problem, assess the scope and develop a prototype	3	3	3	3	3
CO2	execute the project using modern tools	3	3	3	3	3
CO3	develop project report along with its scalability	3	3	3	3	3
CO4	exhibit project management skills	3	3	3	3	3
CO5	make use of engineering knowledge for societal sustenance	3	3	3	3	3

CONSTITUTION OF INDIA (Audit Course-II)

Course	M.Tech.- II-Sem.	L	T	P	C
Subject Code	22AC21	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	illustrate origin, history and philosophy behind Indian constitution	3	3	3
CO2	explain various constitutional rights and duties	3	3	3
CO3	summarizes the governance and legal administrative procedures	3	3	3
CO4	recognize the need for local self government and administration	3	3	3
CO5	identify importance of ECI and election of public representatives	3	3	3



**PEDAGOGY STUDIES
(Audit Course-II)**

Course	M.Tech.- II -Sem.	L	T	P	C
Subject Code	22AC22	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	identify need right pedagogy in light of OBE	3	3	3
CO2	illustrate various modern pedagogical techniques in practice	3	3	3
CO3	interpret various techniques for evaluation and assessment	3	3	3
CO4	analyze the process of learning among stakeholder ecosystems	3	3	3
CO5	implement R&D for use of modern pedagogy with use of ICT	3	3	3

**STRESS MANAGEMENT BY YOGA
(Audit Course-II)**

Course	M.Tech.- II -Sem.	L	T	P	C
Subject Code	22AC23	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	explain need for yoga to control stress	3	3	3
CO2	distinguish yam and niyam applications in real life	3	3	3
CO3	demonstrate methods of lifestyle and work balance	3	3	3
CO4	identify need for physical and mental fitness through yoga	3	3	3
CO5	apply principles and methods of yoga for a complete professional	3	3	3

**PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTMENT SKILLS
(Audit Course-II)**

Course	M.Tech.-II -Sem.	L	T	P	C
Subject Code	22AC24	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	interpret holistic development by neetisatakam sukthis	3	3	3
CO2	explain holistic development and its impact on personality	3	3	3
CO3	illustrate the importance of duties and responsibilities	3	3	3
CO4	explain the term, knowledge, mastery and role model behavior	3	3	3
CO5	exhibit glimpses of bhagavadgita in real life	3	3	3

DIGITAL FORENSICS (Professional Elective – V)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22CSPE31	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	understand relevant legislation and codes of ethics.	3	3	3	3	3
CO2	illustrate the process of cyber crime scene analysis	3	3	3	3	3
CO3	outline the process of evidence management and presentation	3	3	3	3	3
CO4	investigate crime through computer and network forensics	3	3	3	3	3
CO5	illustrate the mobile forensics techniques and tools	3	3	3	3	3

HIGH PERFORMANCE COMPUTING (Professional Elective – V)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22CSPE32	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	explain the concepts in grid computing	3	3	3	3	3



CO2	set up cluster and run parallel applications	3	3	3	3	3
CO3	illustrate the cluster projects and cluster OS	3	3	3	3	3
CO4	explain concepts of pervasive computing & quantum computing	3	3	3	3	3
CO5	analyze classical & quantum logic gates with various algorithms	3	3	3	3	3

QUANTUM COMPUTING (Professional Elective – V)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22CSPE33	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	explain the concepts of quantum computing	3	3	3	3	3
CO2	use mathematical foundations for quantum computing	3	3	3	3	3
CO3	outline the architecture and programming models	3	3	3	3	3
CO4	utilize basic techniques of quantum computing	3	3	3	3	3
CO5	elaborate major algorithms and discuss about OSS toolkits	3	3	3	3	3

BUSINESS ANALYTICS (Open Elective)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22OE31	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	identify and relate variables in business analytics	3	3	3
CO2	build a suitable statistical model through business analytics	3	3	3
CO3	apply predictive analytics and structure business analytics in organization	3	3	3
CO4	forecast variables/attributes and fit trend	3	3	3



CO5	analyze decisions in light of constraints	3	3	3
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INDUSTRIAL SAFETY (Open Elective)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22OE32	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	summarize the industrial safety	3	3	3
CO2	explain the fundamentals of maintenance engineering	3	3	3
CO3	outline the prevention of wear and corrosion	3	3	3
CO4	determine the faults	3	3	3
CO5	illustrate periodic and preventive maintenance	3	3	3

OPERATIONS RESEARCH (Open Elective)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22OE33	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	illustrate various methods and techniques of or	3	3	3
CO2	formulate IBFS for any problem	3	3	3
CO3	apply methods of non-linear programming	3	3	3
CO4	solve problems of scheduling and sequencing	3	3	3
CO5	identify suitable decision and apply to real world problems	3	3	3



COST MANAGEMENT OF ENGINEERING PROJECTS (Open Elective)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22OE34	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	interpret different costing systems	3	3	3
CO2	summarize the elements of project	3	3	3
CO3	analyze cost behavior and profit planning	3	3	3
CO4	examine the budgets	3	3	3
CO5	illustrate quantitative techniques for cost management	3	3	3

COMPOSITE MATERIALS (Open Elective)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22OE35	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	classify composite materials	3	3	3
CO2	analyze reinforcements and mechanical behaviour of components	3	3	3
CO3	manufacture metal matrix composites and carbon composites	3	3	3
CO4	prepare polymer matrix composites	3	3	3
CO5	estimate the strength of composites	3	3	3



DISSERTATION WORK REVIEW - II

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22CSPR31	0	0	12	6

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	identify the problem, assess the scope and develop a prototype	3	3	3	3	3
CO2	execute the project using modern tools	3	3	3	3	3
CO3	develop project report along with its scalability	3	3	3	3	3
CO4	exhibit project management skills	3	3	3	3	3
CO5	make use of engineering knowledge for societal sustenance	3	3	3	3	3

DISSERTATION WORK REVIEW - III

Course	M.Tech.-IV-Sem.	L	T	P	C
Subject Code	22CSPR41	0	0	12	6

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

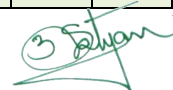
COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	identify the problem, assess the scope and develop a prototype	3	3	3	3	3
CO2	execute the project using modern tools	3	3	3	3	3
CO3	develop project report along with its scalability	3	3	3	3	3
CO4	exhibit project management skills	3	3	3	3	3
CO5	make use of engineering knowledge for societal sustenance	3	3	3	3	3

DISSERTATION VIVA VOCE

Course	M.Tech.-IV-Sem.	L	T	P	C
Subject Code	22CSPR42	0	0	28	14

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
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CO1	describe the problem, scope and research methodology	3	3	3	3	3
CO2	illustrate tools used	3	3	3	3	3
CO3	summarize the findings	3	3	3	3	3
CO4	outline inferences out of project	3	3	3	3	3
CO5	explain conclusions, recommendations and future scope	3	3	3	3	3



DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

M.Tech. – VLSI M.Tech. - Academic Regulations - R22

DIGITAL SYSTEM DESIGN WITH FPGAS

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22VLPC11	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	exposes the design approaches using FPGAs	3	3	3	3	3
CO2	provide in depth understanding of clocked sequential circuits	3	3	3	3	3
CO3	exposes the design approaches of Sequential circuit	3	3	3	3	3
CO4	analyze test pattern generation techniques for fault detection	3	3	3	3	3
CO5	design fault diagnosis in sequential circuits	3	3	3	3	3

CMOS ANALOG IC DESIGN

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22VLPC12	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	describe basic building blocks of CMOS analog ICs	3	3	3	3	3
CO2	construct approaches of current mirror circuits	3	3	3	3	3
CO3	carry out the design of operational amplifiers	3	3	3	3	3
CO4	determine the device dimensions of each MOSFETs involved	3	3	3	3	3
CO5	compare various comparators	3	3	3	3	3

PATTERN RECOGNITION AND MACHINE LEARNING (Professional Elective-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22VLPE11	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	familiar the basics of pattern classes and functionality	3	3	3	3	3
CO2	construct the various linear models	3	3	3	3	3
CO3	use the different kernel methods	3	3	3	3	3
CO4	design the inference in graphical models	3	3	3	3	3
CO5	carry out design of mixture models	3	3	3	3	3



CMOS MIXED SIGNAL DESIGN (Professional Elective-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22VLPE12	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	analyze the switched capacitor circuits	3	3	3	3	3
CO2	illustrate the working and applications of phased lock loop	3	3	3	3	3
CO3	analyze the fundamentals of data converter	3	3	3	3	3
CO4	apply the concepts of Nyquist rate A/D converters	3	3	3	3	3
CO5	explain the oversampling converters	3	3	3	3	3

MEMORY TECHNOLOGIES (Professional Elective-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22VLPE13	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	explain the concepts of random access memory technologies	3	3	3	3	3
CO2	discuss about volatile memories	3	3	3	3	3
CO3	distinguish the concepts of non-volatile memories	3	3	3	3	3
CO4	describe semiconductor memory reliability and radiation effects	3	3	3	3	3
CO5	illustrate various memory technologies	3	3	3	3	3

COMMUNICATION BUSES AND INTERFACES (Professional Elective-II)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22VLPE14	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	select a particular serial bus suitable for a particular application	3	3	3	3	3
CO2	employ the architecture of CAN and applications	3	3	3	3	3
CO3	illustrate PCIe revisions, space configuration and protocols	3	3	3	3	3
CO4	design peripherals that establish interface to serial bus	3	3	3	3	3
CO5	discuss the serial communication protocol	3	3	3	3	3

ARM MICROCONTROLLERS (Professional Elective-II)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22VLPE15	3	0	0	3



Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	construct the selection criteria of ARM processors	3	3	3	3	3
CO2	illustrate Arm Instruction Set	3	3	3	3	3
CO3	explore the ARM development towards functional capabilities	3	3	3	3	3
CO4	create ASM level program using the instruction set	3	3	3	3	3
CO5	prepare the Programming ARM Cortex M	3	3	3	3	3

**EMBEDDED REAL TIME OPERATING SYSTEM
(Professional Elective-II)**

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22VLPE106	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	explain the concepts of RTOS	3	3	3	3	3
CO2	formulate RTOS kernel is implemented	3	3	3	3	3
CO3	describe how the RTOS implements time management	3	3	3	3	3
CO4	discuss interrupts as well timers	3	3	3	3	3
CO5	evaluate real time operating systems like RT Linux	3	3	3	3	3

DIGITAL SYSTEM DESIGN WITH FPGAs LAB

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22VLPC13	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	test logic gates	3	3	3	3	3
CO2	design combinational circuits	3	3	3	3	3
CO3	develop sequential circuits	3	3	3	3	3
CO4	analyze finite state machines	3	3	3	3	3
CO5	construct CMOS circuit schematics and their layouts	3	3	3	3	3

CMOS ANALOG IC DESIGN LAB

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22VLPC14	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	design CMOS logic gates	3	3	3	3	3
CO2	explain CMOS combinational circuits	3	3	3	3	3
CO3	develop CMOS sequential circuits	3	3	3	3	3
CO4	construct CMOS amplifiers	3	3	3	3	3
CO5	implement the CMOS SRAM cell	3	3	3	3	3



RESEARCH METHODOLOGY AND IPR (Mandatory Course)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22MC11	2	0	0	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	formulate research problem	3	3	3	3	3
CO2	analyze research related information	3	3	3	3	3
CO3	follow research ethics	3	3	3	3	3
CO4	perceive nature of IPR and its development	3	3	3	3	3
CO5	outline the patent right	3	3	3	3	3

ENGLISH FOR RESEARCH PAPER WRITING (Audit Course-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22AC11	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	write a technical report without any ambiguity & redundancy	3	3	3
CO2	illustrate how to criticize/highlight-findings avoid plagiarism	3	3	3
CO3	apply various techniques of research to discuss results	3	3	3
CO4	exhibit technical communication skills in documentation	3	3	3
CO5	demonstrate research/technical paper publication skills	3	3	3

DISASTER MANAGEMENT (Audit Course-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22AC12	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	analyze impact of disasters	3	3	3
CO2	choose suitable disaster management mechanism	3	3	3
CO3	make use of appropriate measures for capacity building to reduce risks	3	3	3
CO4	develop strategies to cope up with disasters	3	3	3
CO5	build disaster management plan	3	3	3

SANSKRIT FOR TECHNICAL KNOWLEDGE (Audit Course-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22AC13	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	identify the alphabets	3	3	3
CO2	categorize past/present/future tenses	3	3	3
CO3	determine the roots of the language	3	3	3
CO4	relate the technical information about sanskrit language	3	3	3
CO5	articulate technical concepts of engineering	3	3	3

VALUE EDUCATION (Audit Course-I)

Course	M.Tech.-I-Sem.	L	T	P	C
Subject Code	22AC14	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	interpret moral values, ethics, code of conduct and culture	3	3	3
CO2	illustrate humanity, honesty, devotion, confidence and patriotism	3	3	3
CO3	develop positive thinking, integrity and group cohesiveness	3	3	3
CO4	exhibit friendship, love for truth, and eco-friendly to environment	3	3	3
CO5	identify need for reincarnation, self-control and gender Equity	3	3	3

INTERNET OF THINGS

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22VLPC21	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	explain the concept of internet of things and characteristics	3	3	3	3	3
CO2	describe the M2M with necessary protocols	3	3	3	3	3
CO3	discuss about python scripting language	3	3	3	3	3
CO4	compare IoT architectures	3	3	3	3	3
CO5	examine various types of case studies and IOT applications	3	3	3	3	3

SYSTEM VERILOG TEST BENCHES USING UVM

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22VLPC22	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	implement test bench programs using system Verilog	3	3	3	3	3
CO2	construct object-oriented programming concepts	3	3	3	3	3
CO3	develop random stimulus and SVAs using system Verilog	3	3	3	3	3
CO4	analyze UVM components and UVM phases	3	3	3	3	3
CO5	compose Modeling UVM transactions with all its features	3	3	3	3	3



**VLSI ADVANCED PHYSICAL DESIGN
(Professional Elective – III)**

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22VLPE21	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	conduct power and IR analysis and design power mesh	3	3	3	3	3
CO2	apply low power implementation techniques and UPF formats	3	3	3	3	3
CO3	verify whether the design meets the power intent in UPF	3	3	3	3	3
CO4	examine STA on chip variations	3	3	3	3	3
CO5	perform physical verification of LVS/DRC levels and fix issues	3	3	3	3	3

**SOC DESIGN
(Professional Elective – III)**

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22VLPE22	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	explain basic concept of ASIC	3	3	3	3	3
CO2	discuss about NISC	3	3	3	3	3
CO3	illustrate the basic concepts Simulation	3	3	3	3	3
CO4	describe Low power SoC design	3	3	3	3	3
CO5	make use of Synthesis	3	3	3	3	3

**DESIGN FOR TESTABILITY
(Professional Elective – III)**

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22VLPE23	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	discuss the Scope of testing and verification in VLSI design process	3	3	3	3	3
CO2	explain Fundamentals of VLSI testing and scan based design	3	3	3	3	3
CO3	analyze BIST for testing of logic and memories	3	3	3	3	3
CO4	design test automation for functional verification	3	3	3	3	3
CO5	describe about Testing Models	3	3	3	3	3

**DEVICE MODELLING
(Professional Elective – IV)**

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22VLPE24	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	explain MOS contacts and modes of operations	3	3	3	3	3
CO2	describe the behavior of capacitor characteristics.	3	3	3	3	3
CO3	analyze small signal modeling	3	3	3	3	3
CO4	perform the switching characteristics the VLSI circuits	3	3	3	3	3
CO5	use the FinFET for various applications	3	3	3	3	3

RF IC DESIGN (Professional Elective – IV)

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22VLPE25	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	analyze the behavior of high frequency components	3	3	3	3	3
CO2	illustrate various forms of RF filter design	3	3	3	3	3
CO3	implement component modelling and biasing networks	3	3	3	3	3
CO4	examine of RF transistor amplifier design	3	3	3	3	3
CO5	design the various RF filters, oscillators and mixers	3	3	3	3	3

HARDWARE AND SOFTWARE CO-DESIGN (Professional Elective – IV)

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22VLPE26	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	acquire the knowledge on various models of co-design	3	3	3	3	3
CO2	analyze prototyping and target architectures	3	3	3	3	3
CO3	compile tools for embedded processor architectures	3	3	3	3	3
CO4	compare techniques of design specification and verification	3	3	3	3	3
CO5	implement validation methods and adaptability	3	3	3	3	3

INTERNET OF THINGS LAB

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22VLPC23	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	improve working on basic IoT devices	3	3	3	3	3
CO2	determine learning and utilization of IoT devices	3	3	3	3	3
CO3	develop automation work-flow in IoT enabled environment	3	3	3	3	3
CO4	recommend working on advance IoT Systems	3	3	3	3	3
CO5	test remote IoT systems in the interest of society	3	3	3	3	3



VLSI DESIGN VERIFICATION AND TESTING LAB

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22VLPC24	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	simulate different classes and loops in System Verilog	3	3	3	3	3
CO2	test and verify Front-End-Design in different environments	3	3	3	3	3
CO3	verify efficiency and effectiveness of complex designs	3	3	3	3	3
CO4	analyze, design and simulate digital circuits	3	3	3	3	3
CO5	apply CAD tools for the design of digital circuits	3	3	3	3	3

MINI PROJECT WITH SEMINAR

Course	M.Tech.-II-Sem.	L	T	P	C
Subject Code	22VLPR21	0	0	4	2

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	identify the problem, assess the scope and develop a prototype	3	3	3	3	3
CO2	execute the project using modern tools	3	3	3	3	3
CO3	develop project report along with its scalability	3	3	3	3	3
CO4	exhibit project management skills	3	3	3	3	3
CO5	make use of engineering knowledge for societal sustenance	3	3	3	3	3

CONSTITUTION OF INDIA (Audit Course-II)

Course	M.Tech.- II-Sem.	L	T	P	C
Subject Code	22AC21	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	illustrate origin, history and philosophy behind Indian constitution	3	3	3
CO2	explain various constitutional rights and duties	3	3	3
CO3	summaries the governance and legal administrative procedures	3	3	3
CO4	recognize the need for local self government and administration	3	3	3
CO5	identify importance of ECI and election of public representatives	3	3	3

PEDAGOGY STUDIES (Audit Course-II)

Course	M.Tech.- II -Sem.	L	T	P	C
Subject Code	22AC22	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
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(Signature)

CO1	identify need right pedagogy in light of OBE	3	3	3
CO2	illustrate various modern pedagogical techniques in practice	3	3	3
CO3	interpret various techniques for evaluation and assessment	3	3	3
CO4	analyze the process of learning among stakeholder ecosystems	3	3	3
CO5	implement R&D for use of modern pedagogy with use of ICT	3	3	3

STRESS MANAGEMENT BY YOGA (Audit Course-II)

Course	M.Tech.- II -Sem.	L	T	P	C
Subject Code	22AC23	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	explain need for yoga to control stress	3	3	3
CO2	distinguish yam and niyam applications in real life	3	3	3
CO3	demonstrate methods of lifestyle and work balance	3	3	3
CO4	identify need for physical and mental fitness through yoga	3	3	3
CO5	apply principles and methods of yoga for a complete professional	3	3	3

PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS (Audit Course-II)

Course	M.Tech.-II -Sem.	L	T	P	C
Subject Code	22AC24	2	0	0	0

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	interpret holistic development by neethi satakam sukthis	3	3	3
CO2	explain holistic development and its impact on personality	3	3	3
CO3	illustrate the importance of duties and responsibilities	3	3	3
CO4	explain the term, knowledge, mastery and role model behavior	3	3	3
CO5	exhibit glimpses of bhagavadgita in real life	3	3	3

ADVANCED COMPUTER ARCHITECTURE (Professional Elective – V)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22VLPE31	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	illustrate the instruction set, memory addressing of computer	3	3	3	3	3
CO2	handle the issues in pipelining and parallelism	3	3	3	3	3
CO3	level parallelism the hardware and ILP software approach	3	3	3	3	3
CO4	compare multiprocessors and thread level parallelism	3	3	3	3	3
CO5	familiarize the practical issues in inter network	3	3	3	3	3



NANOMATERIALS AND NANOTECHNOLOGY (Professional Elective – V)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22VLPE32	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	discuss the types of nanomaterials.	3	3	3	3	3
CO2	relate nano-materials for different applications	3	3	3	3	3
CO3	examine MEMS and quantum dots	3	3	3	3	3
CO4	propose carbon nanotubes for memories.	3	3	3	3	3
CO5	organize nano electronics for quantum computers	3	3	3	3	3

HARDWARE SECURITY (Professional Elective – V)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22VLPE33	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	describe counter-measures of various hardware attacks	3	3	3	3	3
CO2	experiment the impressive efficiency of hardware attacks	3	3	3	3	3
CO3	illustrate side channel attacks and mitigate risk of attacks	3	3	3	3	3
CO4	analyze silicon security and trust assessment for SoCs	3	3	3	3	3
CO5	design secure systems to privilege escalation and compromise	3	3	3	3	3

BUSINESS ANALYTICS (Open Elective)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22OE31	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	identify and relate variables in business analytics	3	3	3
CO2	build a suitable statistical model through business analytics	3	3	3
CO3	apply predictive analytics and structure business analytics in organization	3	3	3
CO4	forecast variables/attributes and fit trend	3	3	3
CO5	analyze decisions in light of constraints	3	3	3

INDUSTRIAL SAFETY (Open Elective)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22OE32	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)



COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	summarize the industrial safety	3	3	3
CO2	explain the fundamentals of maintenance engineering	3	3	3
CO3	outline the prevention of wear and corrosion	3	3	3
CO4	determine the faults	3	3	3
CO5	illustrate periodic and preventive maintenance	3	3	3

OPERATIONS RESEARCH (Open Elective)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22OE33	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	illustrate various methods and techniques of or	3	3	3
CO2	formulate IBFS for any problem	3	3	3
CO3	apply methods of non-linear programming	3	3	3
CO4	solve problems of scheduling and sequencing	3	3	3
CO5	identify suitable decision and apply to real world problems	3	3	3

COST MANAGEMENT OF ENGINEERING PROJECTS (Open Elective)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22OE34	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)


COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	interpret different costing systems	3	3	3
CO2	summarize the elements of project	3	3	3
CO3	analyze cost behavior and profit planning	3	3	3
CO4	examine the budgets	3	3	3
CO5	illustrate quantitative techniques for cost management	3	3	3

COMPOSITE MATERIALS (Open Elective)

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22OE35	3	0	0	3

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3
CO1	classify composite materials	3	3	3
CO2	analyze reinforcements and mechanical behaviour of components	3	3	3
CO3	manufacture metal matrix composites and carbon composites	3	3	3
CO4	prepare polymer matrix composites	3	3	3
CO5	estimate the strength of composites	3	3	3



DISSERTATION WORK REVIEW - II

Course	M.Tech.-III-Sem.	L	T	P	C
Subject Code	22VLPR301	0	0	12	6

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	identify the problem, assess the scope and develop a prototype	3	3	3	3	3
CO2	execute the project using modern tools	3	3	3	3	3
CO3	develop project report along with its scalability	3	3	3	3	3
CO4	exhibit project management skills	3	3	3	3	3
CO5	make use of engineering knowledge for societal sustenance	3	3	3	3	3

DISSERTATION WORK REVIEW - III

Course	M.Tech.-IV-Sem.	L	T	P	C
Subject Code	22VLPR41	0	0	12	6

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	identify the problem, assess the scope and develop a prototype	3	3	3	3	3
CO2	execute the project using modern tools	3	3	3	3	3
CO3	develop project report along with its scalability	3	3	3	3	3
CO4	exhibit project management skills	3	3	3	3	3
CO5	make use of engineering knowledge for societal sustenance	3	3	3	3	3

DISSERTATION VIVA VOCE

Course	M.Tech.-IV-Sem.	L	T	P	C
Subject Code	22VLPR402	0	0	28	14

Course Outcomes (COs) & CO-PO Mapping (3-Strong; 2-Medium; 1-Weak Correlation)

COs	Upon completion of course the students will be able to	PO1	PO2	PO3	PSO1	PSO2
CO1	describe the problem, scope and research methodology	3	3	3	3	3
CO2	illustrate tools used	3	3	3	3	3
CO3	summarize the findings	3	3	3	3	3
CO4	outline inferences out of project	3	3	3	3	3
CO5	explain conclusions, recommendations and future scope	3	3	3	3	3



SAMPLE COLLEGE VISSION AND MISSION AND QUALITY POLICY:



Fig1: SAMPLE COLLEGE VISSION AND MISSION AND QUALITY POLICY at Corridor

SAMPLE DEPARTMENT VISSION AND MISSION AND QUALITY POLICY and PO's , PEO's, PSO's:

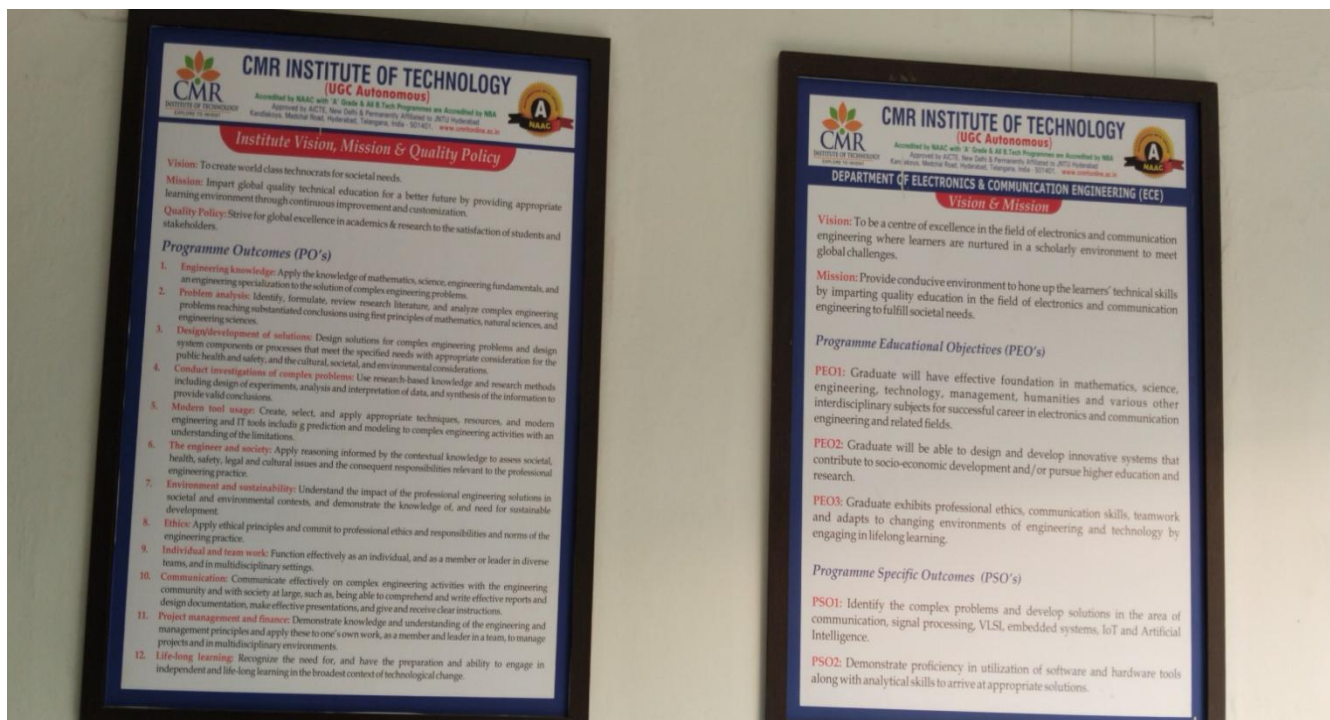


Fig2: SAMPLE DEPARTMENT ECE VISSION AND MISSION AND QUALITY POLICY and PO's, PEO's, PSO's at corridor

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 Kandlakoya (V), Medchal Road,
 Hyderabad-501 401.

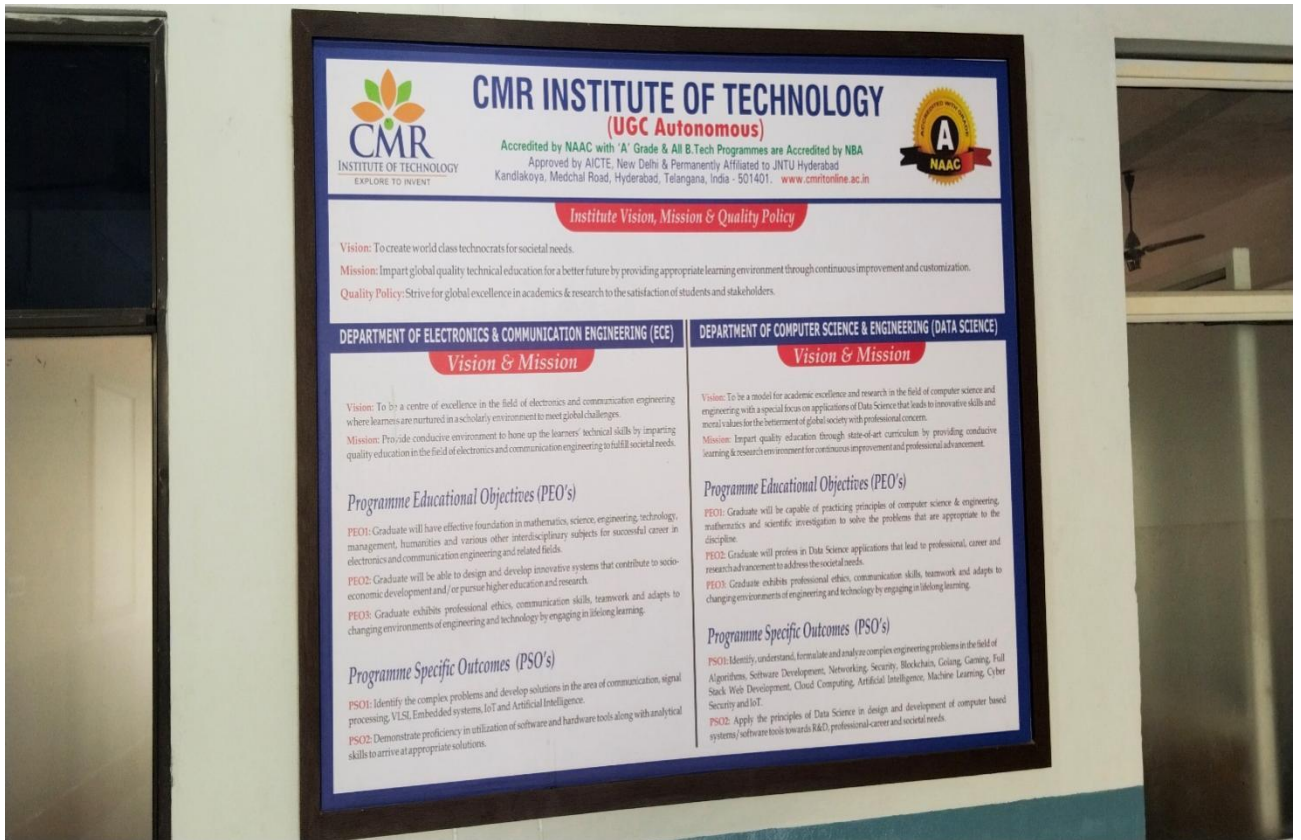


Fig3: SAMPLE DEPARTMENT ECE & CSE(DS) VISSION AND MISSION, PEO's, PSO's at Corridor



Fig4: SAMPLE DEPARTMENT CSE & CSE(AI ML) VISSION AND MISSION, PEO's, PSO's at Corridor

3/2/2024
S. Srinivas

SAMPLE VISSION AND MISSION at CLASSROOMS:

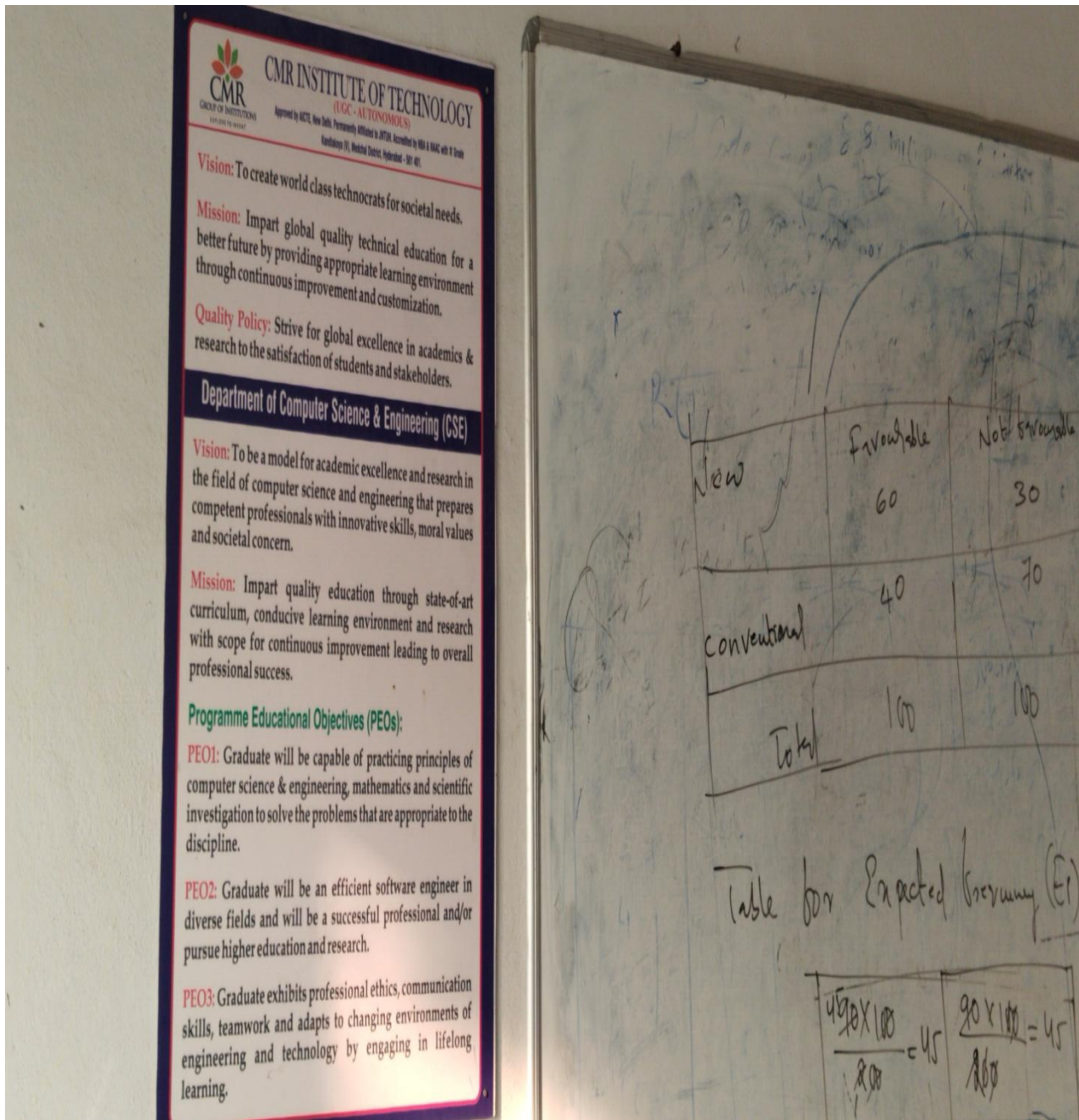


Fig5: SAMPLe VISSION AND MISSION at CLASSROOMS

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SAMPLE CO's at LABS:

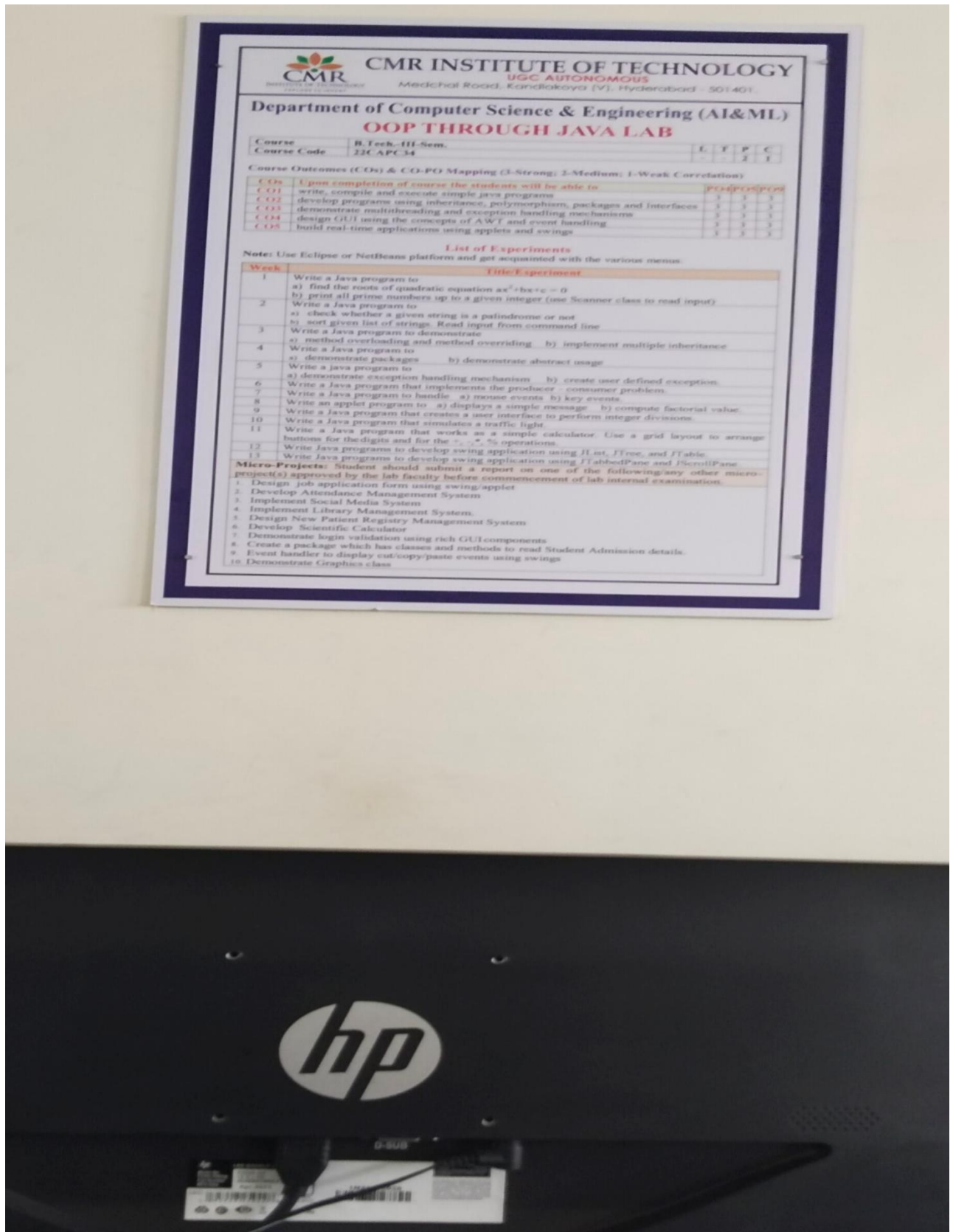


Fig6: SAMPLe CO's at LABS

(Signature)

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 Hyderabad-501 401.

SAMPLE CO's and DEFINATIONS at LABS:



Fig7: SAMPLE CO's and DEFINATIONS at LABS

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Hyderabad-501 401.

SAMPLE FACULTY MEETING CONDUCTED BY HOD :



Fig8:SAMPLE FACULTY MEETING CONDUCTED BY HOD


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Kandlakoya (V), Medchal Road,
Hyderabad-501 401.

SAMPLE FACULTY MEETING ATTENDENCE SHEET CONDUCTED BY HOD:

CMR INSTITUTE OF TECHNOLOGY
(UGC AUTONOMOUS)
Approved by AICTE, Permanently Affiliated to JNTUH, Accredited by NAAC with A Grade and NBA
Kandlakoya (V), Medchal Dist - 501 401
DEPARTMENT OF CSE
STAFF DETAILS

S.No	EMP ID	Faculty name	DEPT	Designation	Signature
1	1649	Dr.Kumbala Pradeep Reddy	CSE(AI&ML)	Assoc.Prof	Absent
2	1659	Dr.L.Arokia Jesu Prabhu	CSE(AI&ML)	Assoc.Prof	Absent
3	1686	Dr.S.Dhanalakshmi	CSE(AI&ML)	Assoc.Prof	Absent
4	1655	Mr.Nomula Suresh	CSE(AI&ML)	Asst.Prof	Absent
5	1664	Mrs.V.Surekha	CSE(AI&ML)	Asst.Prof	Absent
6	1651	Ms.Talari Swapna	CSE(AI&ML)	Asst.Prof	Absent
7	1610	Mr.G Venu Gopal Rao	CSE(AI&ML)	Asst.Prof	Absent
8	15003	Mr.K.Venkata Balamurali krishna	CSE(AI&ML)	Asst.Prof	Absent
9	1634	Mrs.B.Annapoorna	CSE(AI&ML)	Asst.Prof	Absent
10	4084	Mrs.A.Lakshmi Prasanna	CSE (AI&ML)	Asst.Prof	Absent
11	15012	Mr.Mruthyunjayam.Allakonda	CSE(AI&ML)	Asst.Prof	Absent
12	1672	Mr.V.Shiva Kumar	CSE (AI&ML)	Asst.Prof	Absent
13	4018	Mr.Rajendar Reddy Gaddam	CSE (AI&ML)	Asst.Prof	Absent
14	15015	Mr.B.Pradeep	CSE (AI&ML)	Asst.Prof	Absent
15	15016	Mr.P.Vijay Kumar	CSE (AI&ML)	Asst.Prof	Absent
16	15008	Ms.Kilari Ram Priya	CSE (AI&ML)	Asst.Prof	Absent
17	CM524	Mr P Niranjana reddy	CSE (AI&ML)	Asst.Prof	Absent
18	CM531	Mr.M Satish	CSE (AI&ML)	Asst.Prof	Absent
19	CM538	Mr.B.Anil Kumar	CSE (AI&ML)	Asst.Prof	Absent
20	CM557	KOMAL BIRADAR	CSE (AI&ML)	Asst.Prof	Absent
21	CM609	V.VIJAYA	CSE (AI&ML)	Asst.Prof	Absent
22	CM560	VISALAKSHI J	CSE (AI&ML)	Asst.Prof	Absent
23	CM539	M D V PRASAD	CSE (AI&ML)	Asst.Prof	Absent
24	CM501	S SAI PRASANNA	CSE (AI&ML)	Asst.Prof	Absent
25	CM572	CH.SWAPNA	CSE (AI&ML)	Asst.Prof	Absent
26	CM550	PECHETTI SUJANI	CSE (AI&ML)	Asst.Prof	Absent
27	5111	MAGGIDI MOUNIKA	CSE (AI&ML)	Asst.Prof	Absent
28	CM635	C VIJAY KUMAR	CSE (AI&ML)	Asst.Prof	Absent
29	CM636	VIBHA LAKSHMI	CSE (AI&ML)	Asst.Prof	Absent
30	1673	Dr. K.Ruben Raju	AI&ML	Assoc.Prof	Absent
31	CM506	Mrs.B Sindhuja	AI&ML	Asst.Prof	Absent
32	CM545	Mr.Vinod gendre	AI&ML	Asst.Prof	Absent
33	CM546	A.MADHAVI	AI&ML	Asst.Prof	Absent
34	CM548	MANTESH PATIL	AI&ML	Asst.Prof	Absent
35	CM553	JYOTHI KUNTA	AI&ML	Asst.Prof	Absent
36	CM556	BHAVANI MANCHALA	AI&ML	Asst.Prof	Absent
37	CM495	DEEPTHI POTLAKAYALA	AI&ML	Asst.Prof	Absent
38	1350	Mr.Sri Rama Krishna.Thota	CSE (AI&ML)	Jr.Asst	Absent
39	5066	Mrs.G.Manikyamu	CSE (AI&ML)	Lab Asst	Absent
40	5114	Mrs G Jyothi	CSE (AI&ML)	Lab Asst	Absent
41	CM507	Mr.V Shiva sai	CSE (AI&ML)	Lab Asst	Absent
42	CM542	Mrs.K.Rajitha	CSE (AI&ML)	Lab Asst	Absent
43	CM629	Ms.N.jayashree	CSE (AI&ML)	Lab Asst	Absent
44	cm620	ms. Suchi Laad	CSE	Asst Prof	Absent

Fig9:SAMPLE FACULTY MEETING ATTENDENCE SHEET CONDUCTED BY HOD


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 Hyderabad-501 401.