


Dr. B. Satyanarayana

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

Date : 20.12.2023

Authentication Certificate

This is to certify that the Institution ensures implementation of its stated Code of Ethics for research.



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Kandlakoya (V), Medchal Road,
Hyderabad-501 401.

Index 3.4.1

The Institution ensures implementation of its stated Code of Ethics for research.

SI. No.	Table of Content	Pg. No
1	Ethics Committee	1
2	Research Advisory Committee	2
3	Research Methodology Syllabus	4
4	Plagiarism Check Software	19



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CMRIT/R&D/EC

Date: 03/08/2022

Office-Order

The following faculty are appointed as Members of Ethics and Research Committee for the academic year 2022-23.

Ethics Committee-2022-2023			
S.No	Name	Designation	Role
1	Dr.B.Satyanarayana	Professor & Principal	Chairman
2	Dr. Vijender Kumar Solanki	Associate Professor & Dean R&D	Member Secretary
3	Prof. A Prakash	Associate Professor, Dept. of CSE	Member
4	Dr. G Balakrishna	Associate Professor	Member
5	Dr. K.Pradeep Reddy	Associate Professor & HOD	Member
6	Dr. Arokia Jesu Prabhu	Associate Professor & HOD	Member
7	Dr. K Niranjan Reddy	Associate Professor & HOD	Member
8	Dr. A Sudhakar	Associate Professor	Member
9	Dr. Tulasi Lakshmi Devi	Professor & HOD	Member
10	Dr. J. Ramesh	Assistant Professor	Member
11	Prof. G. Uma Maheshwara Rao	Associate Professor	Member
12	Dr. G. Sai Rekha	Professor & HOD	Member



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1

CMRIT/R&D/RM

Date: 08/08/2022

The following Members are appointed as Research Advisory Committee members for the academic year 2022-23.

S.No	Name	Designation	Role
1	Dr. B Satyanarayana	Principal & Professor	Chairman
2	Dr. Vijender Kumar Solanki	Dean R&D, Associate Professor	Member Secretary
3	Dr. Sheo Kumar	Professor, CMR Engineering College	Member
4	Dr Pradeep Kumar	Professor, MANUU, Hyderabad	Member
5	Dr. D. Sivaganesan	Professor, PSG Institute of Technology and Applied Research, Tamilnadu.	Member



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CMRIT/ERM//2022-23

Date: 13-08-2022

Minutes of Meeting- R&D

Agenda of the Meeting- To audit the publications of the past year and suggest changes in the plan

The meeting began with the addresses by Principal and Dean, R&D where they praised the publication efforts of last year and suggested improvements for the upcoming years. It was decided that the following tasks should be performed to improve the research framework of our Institution:

1. To prepare a brief report of the publications made within the past one year and to highlight the research activities.
2. It was advised to use a standard plagiarism tool before paper submission to avoid rejection on the grounds of high plagiarism.
3. The faculty members supervising PhD students were advised to bring best practices to higher education.
4. Higher authorities appreciated students' publications and advised to ensure that all postgraduate students get at least one paper published in any Scopus-indexed journal.



Principal

Ethics & Research Committee Chairperson



Dean R&D
Dr. Vijender Kumar Solanki



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MASTER OF BUSINESS ADMINISTRATION

III – Semester (II – Year)									
S. No.	Subject Code	Subject	Hours Per Week			Credits	Scheme of Evaluation		
			L	T	P		Maximum Marks		
							Int.	Ext.	Tot.
1	18MBPCC2101	Strategic Management	3	1	0	4	30	70	100
2	18MBPCC2102	Research Methodology	3	1	0	4	30	70	100
3	18MBOEC2103	Open Elective-1	3	0	0	3	30	70	100
		A: Business Ethics & Corporate Governance							
		B: Total Quality Management							
		C: DBMS							
		D: Disability & Rehabilitation							
		E: C-Programming							
F: Disaster Management									
4	18MBPEC2104	Core Elective-1	3	0	0	3	30	70	100
		E:Startup Management							
		F:Security Analysis and Portfolio Management							
		H:Performance Management Systems							
M:Digital Marketing									
5	18MBPEC2105	Core Elective-2	3	0	0	3	30	70	100
		E: Management of NGOs & MSME							
		F:Financial Institutions, Markets and Services							
		H:Learning & Development							
M:Advertising & Sales Management									
6	18MBPEC2106	Core Elective-3	3	0	0	3	30	70	100
		E:Project Management							
		F:Advanced Management Accounting							
		H:Management of Industrial Relations							
M:Consumer Behaviour									
7	18MBPPC2107	Computer Applications to Business – Lab	0	0	2	1	30	70	100
8	18MBPPC2108	Professional Development, Yoga & Spirituality – Practice	2	0	2	3	30	70	100
TOTAL			20	2	4	24	240	560	800


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RESEARCH METHODOLOGY

II-MBA-III-Sem.
Subject Code: 18MBPCC2102

L T P C
3 1 - 4

Course Objectives:

1. The need, types and process of research carried out in various fields.
2. The difference between qualitative and quantitative research and also testing the validity of research design.
3. Collection of data and selection of a sample for the analysis.
4. Data classification, coding and presentation of data using tables, graphs and diagrams.
5. Measurement of scaling techniques, errors in measurement and difference between comparative and non-comparative scaling techniques.
6. Reporting writing skills, guidelines to be followed in case of hypothesis formulation, data collection and interpretation.

Course Outcomes:

1. To apply the principles of research methodology for the research design for mini and major projects.
2. To test the validity and reliability of the model to be tested under the study.
3. To choose the appropriate sample with a suitable scale of measurement.
4. To select appropriate data sources- primary and secondary.
5. To analyse the data statistically and draw inferences.
6. To use of Excel and SPSS in Project Report.

Unit-I: Research Methodology

10 hours

Overview of Research methodology-Research problems, Types of Research, Research process-Ethics in business research-limitations of social science research. Observation studies and research.

Unit-II: Design of Business research

10 hours

Research design an overview: Qualitative research Vs Quantitative Research, Types of research design, Validity of research design, Types of designs

Unit-III: Data Collection Methods & Tools

10 hours

Part A:

5 hours

Primary Data, Secondary Data, designing questionnaire and Schedule of questions, relevant cases and exercises

Part B:

5 hours

Sampling methods: Random, Non-Random Techniques, Tabulation, interpretation and analysis of data.

Unit-IV: Measurement of scaling Techniques

12 hours

Introduction objectives Qualitative research Vs Quantitative measures, classification /types of measures characteristics/goodness of instruments/measurement of scales. Errors in measurement. Types of scales Techniques comparative and non-comparative scaling techniques guidelines for deciding scales.

Unit-V: Report writing & Bibliography

12 hours

Introduction , Objectives , format of a report , classification of the sectors of the report, PowerPoint presentations of the reports, Synopsis Vs main report, Footnotes, Importance of hypotheses and objectives in report writing ,Types of reports ,Report format , cover page, preliminary pages, main body , appendices and bibliography , Importance of Excel and SPSS in report writing.

References:

1. Krishna Swamy,Sivakumar,Mathirajan-Management Research Methodology,Pearson,2014
2. R.Pannerselvam -Research Methodology-, PHI, 2014
3. T N Srivatsava, shailaja rego -Business research Methods-TMH,2014
4. Business research Methods -Donald R cooper, Pamela S Schindler, 10ed, Mcgraw hill, 2015.
5. William .G. Zikmund- Business Research Methods, 8ed, Cengage, 2016.
6. Business Research Methods-SL Gupta, Hitesh Gupta, 2ed, 2015.
7. Business Research Methodology, T N Srivastava, Shailaja Rego, Mcgraw Hill, 2016.
8. Business Research Methods, 2/e Naval Bajpai, Pearson, 2017.



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MASTER OF BUSINESS ADMINISTRATION

III – Semester (II – MBA – I - Semester)									
S. No	Subject Code	Subject	Hours Per Week			Credits	Scheme of Evaluation		
			L	T	P		Maximum Marks		
							Int.	Ext.	Tot.
1	20MBAPC301	Strategic Management	3	1	0	4	30	70	100
2	20MBAPC302	Research Methodology	3	1	0	4	30	70	100
3	Open Elective-1		3	0	0	3	30	70	100
	20MBAOE301	Disaster Management							
	20MBAOE302	Total Quality Management							
	20MBAOE303	Environmental Science							
	20MBAOE304	C- Programming							
4	Core Elective-1		3	0	0	3	30	70	100
	20MBAPE301	E: Startup Management							
	20MBAPE304	F: Indian Financial System							
	20MBAPE307	H: Recruitment, Selection & Induction							
	20MBAPE310	M: Consumer Behaviour							
5	Core Elective-2		3	0	0	3	30	70	100
	20MBAPE302	E: Family Business Management							
	20MBAPE305	F: Security Analysis & Portfolio Management							
	20MBAPE308	H: Learning, Training & Development							
	20MBAPE311	M: Retailing Management							
6	Core Elective-3		3	0	0	3	30	70	100
	20MBAPE303	E: MSME & Management of NGOs							
	20MBAPE306	F: Financial Derivatives							
	20MBAPE309	H: Compensation and Reward Management							
	20MBAPE312	M: Services Marketing							
7	20MBAPC303	Computer Applications to Business Practice	-	1	2	2	30	70	100
8	20MBAPR301	Field work / Summer Internship	-	-	-	2	-	100	100
Total			18	3	2	24	210	590	800

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RESEARCH METHODOLOGY

Year & Semester:	II MBA I Semester	L	T	P	C	
Subject Code:	20MBAPC302	3	1	0	4	
CO	CO Statement	CO-PO Mapping				
		PO1	PO2	PO3	PO4	PO5
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 table 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
		1- Weak, 2-Moderate & 3-Strong				

Unit-I: Research Methodology **10 hours**

Overview of Research methodology-Research problems, Types of Research, Research process-Ethics in business research-limitations of social science research.

Unit-II: Design of Business research **10 hours**

Research design an overview: Qualitative research Vs Quantitative Research, Types of research design, Validity of research design, Types of designs

Unit-III: Data Collection Methods & Tools **8 hours**

Part A: **4 hours**

Primary Data, Secondary Data, designing questionnaire and Schedule of questions, relevant cases and exercises

Part B: **4 hours**

Sampling methods: Random, Non-Random Techniques, Tabulation, interpretation and analysis of data.

Unit-IV: Measurement of scaling Techniques **10 hours**

Classification & types of measurement of scales, types of measures characteristics/goodness of instruments/measurement of scales. Errors in measurement. Guidelines for deciding scales.

Unit-V: Report writing & Bibliography **10 hours**

Guidelines for report writing, format of a report, components of reports, types of reports. Rules for bibliography, Importance of Excel and SPSS in report writing.

References:

1. Research Methodology: Methods and Techniques. By C. R. Kothari & Gaurav, New Age International Publishers, 2018.
2. R.Pannerselvam -Research Methodology-, PHI, 2014.
3. Business research Methods -Donald R cooper, Pamela S Schindler, 10ed, Mcgraw hill, 2015.
4. William .G. Zikmund- Business Research Methods, 8ed, Cengage, 2016.
5. Business Research Methods, 2/e Naval Bajpai, Pearson, 2017.



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M.Tech. (CAD/CAM) – R20 COURSE STRUCTURE

(Applicable from the batch admitted during 2020-21 and onwards)

I – Semester									
S. No	Course Code	Subject	Hours Per Week			Credits	Scheme of Evaluation		
			L	T	P		Maximum Marks		
							Int.	Ext.	Tot.
1	20CAPC101	Computer Aided Design	3	0	0	3	30	70	100
2	20CAPC102	Computer Aided Manufacturing	3	0	0	3	30	70	100
3	Professional Elective-1:		3	0	0	3	30	70	100
	20CAPE101	Mechanical Behavior of Materials							
	20CAPE102	Experimental Stress Analysis							
	20CAPE103	Fuzzy Logic & Neural Networks							
4	Professional Elective-2 :		3	0	0	3	30	70	100
	20CAPE104	Simulation & Analysis of Manufacturing Systems							
	20CAPE105	Computer Aided Process Planning							
	20CAPE106	Industrial Robotics							
5	20CAPC103	Computer Aided Design Lab	0	0	4	2	30	70	100
6	20CAPC104	Simulation of Manufacturing Systems Lab	0	0	4	2	30	70	100
7	20MC101	Research Methodology and IPR	2	0	0	2	30	70	100
8	Audit Course -1		2	0	0	0	100	-	100
	20AC101	English for Research Paper Writing							
	20AC102	Value Education							
	20AC103	Constitution of India							
TOTAL			16	0	8	18	310	490	800


II – Semester									
S. No.	Course Code	Subject	Hours Per Week			Credits	Scheme of Evaluation		
			L	T	P		Maximum Marks		
							Int.	Ext.	Tot.
1	20CAPC201	Advanced Finite Element Analysis	3	0	0	3	30	70	100
2	20CAPC202	Automation in Manufacturing	3	0	0	3	30	70	100
3	Professional Elective -3		3	0	0	3	30	70	100
	20CAPE201	Intelligent Manufacturing Systems							
	20CAPE202	Advanced Manufacturing Processes							
	20CAPE203	Optimization Techniques & Applications							
4	Professional Elective -4		3	0	0	3	30	70	100
	20CAPE204	Advanced Mechatronics							
	20CAPE205	Micro Electro Mechanical Systems							
	20CAPE206	Additive Manufacturing Technologies							
5	20CAPC203	Automation in Manufacturing Lab	0	0	4	2	30	70	100
6	20CAPC204	Computer Aided Engineering Lab	0	0	4	2	30	70	100
7	20CAPR201	Mini Project with Seminar	0	0	4	2	30	70	100
8	Audit Course -2		2	0	0	0	100	-	100
	20AC201	Pedagogy Studies							
	20AC202	Stress Management by yoga							
	20AC203	Personality Development through Life Enlightenment Skills							
TOTAL			14	0	12	18	310	490	800

M.Tech. (Computer Science & Engineering) – R20 Course Structure

(Applicable from the batch admitted during 2020-21 and onwards)

I – Semester									
S. No	Course Code	Subject	Hours Per Week			Credits	Scheme of Evaluation		
			L	T	P		Maximum Marks		
							Int.	Ext.	Tot.
1	20CSPC101	Advanced Data Structures	3	0	0	3	30	70	100
2	20CSPC102	Machine Learning	3	0	0	3	30	70	100
3	Professional Elective-1:		3	0	0	3	30	70	100
	20CSPE101	Information Security							
	20CSPE102	Mobile Application Development							
	20CSPE103	Web & Database Security							
4	Professional Elective-2 :		3	0	0	3	30	70	100
	20CSPE104	Digital Marketing							
	20CSPE105	Distributed Systems							
	20CSPE106	Parallel Computing							
5	20CSPC103	Advanced Data Structures Lab	0	0	4	2	30	70	100
6	20CSPC104	Machine Learning Lab	0	0	4	2	30	70	100
7	20MC101	Research Methodology and IPR	2	0	0	2	30	70	100
8	Audit Course -1		2	0	0	0	100	-	100
	20AC101	English for Research Paper Writing							
	20AC102	Value Education							
	20AC103	Constitution of India							
TOTAL			16	0	8	18	310	490	800

II – Semester									
S. No.	Course Code	Subject	Hours Per Week			Credits	Scheme of Evaluation		
			L	T	P		Maximum Marks		
							Int.	Ext.	Tot.
1	20CSPC201	Advanced Algorithms	3	0	0	3	30	70	100
2	20CSPC202	Data Sciences	3	0	0	3	30	70	100
3	Professional Elective -3		3	0	0	3	30	70	100
	20CSPE201	Software Project Management							
	20CSPE202	Natural Language Processing							
	20CSPE203	Cyber Security							
4	Professional Elective -4		3	0	0	3	30	70	100
	20CSPE204	Artificial Intelligence							
	20CSPE205	Blockchain Technology							
	20CSPE206	Computer Forensics							
5	20CSPC203	Advanced Algorithms Lab	0	0	4	2	30	70	100
6	20CSPC204	Data Sciences Lab	0	0	4	2	30	70	100
7	20CSPR201	Mini Project with Seminar	0	0	4	2	30	70	100
8	Audit Course -2		2	0	0	0	100	-	100
	20AC201	Pedagogy Studies							
	20AC202	Stress Management by yoga							
	20AC203	Personality Development through Life Enlightenment Skills							
TOTAL			14	0	12	18	310	490	800


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M.Tech. (Structural Engineering) – R20 COURSE STRUCTURE

(Applicable from the batch admitted during 2020-21 and onwards)

I – Semester									
S. No	Course Code	Subject	Hours Per Week			Credits	Scheme of Evaluation		
			L	T	P		Maximum Marks		
							Int.	Ext.	Tot.
1	20SEPC101	Advanced Concrete Technology	3	0	0	3	30	70	100
2	20SEPC102	Theory of Elasticity	3	0	0	3	30	70	100
3	Professional Elective-1:		3	0	0	3	30	70	100
	20SEPE101	Advanced Reinforced Concrete Design							
	20SEPE102	Theory and Applications of Cement Composites							
	20SEPE103	Theory of Structural Stability							
4	Professional Elective-2 :		3	0	0	3	30	70	100
	20SEPE104	Numerical Methods in Structural Engineering							
	20SEPE105	Structural Health Monitoring							
	20SEPE106	Structural Optimization							
5	20SEPC103	Advanced Concrete Technology Lab-I	0	0	4	2	30	70	100
6	20SEPC104	Numerical Analysis Lab	0	0	4	2	30	70	100
7	20MC101	Research Methodology and IPR	2	0	0	2	30	70	100
8	Audit Course -1		2	0	0	0	100	-	100
	20AC101	English for Research Paper Writing							
	20AC102	Value Education							
	20AC103	Constitution of India							
TOTAL			16	0	8	18	310	490	800

II – Semester									
S. No.	Course Code	Subject	Hours Per Week			Credits	Scheme of Evaluation		
			L	T	P		Maximum Marks		
							Int.	Ext.	Tot.
1	20SEPC201	FEM in Structural Engineering	3	0	0	3	30	70	100
2	20SEPC202	Structural Dynamics	3	0	0	3	30	70	100
3	Professional Elective -3		3	0	0	3	30	70	100
	20SEPE201	Advanced Steel Design							
	20SEPE202	Design of Formwork							
	20SEPE203	Design of Masonry Structures							
4	Professional Elective -4		3	0	0	3	30	70	100
	20SEPE204	Theory of Thin Plates & Shells							
	20SEPE205	Advanced Design of Foundations							
	20SEPE206	Design of Industrial Structures							
5	20SEPC203	Structural Design Lab	0	0	4	2	30	70	100
6	20SEPC204	Advanced Concrete Technology Lab-II	0	0	4	2	30	70	100
7	20SEPR201	Mini Project with Seminar	0	0	4	2	30	70	100
8	Audit Course -2		2	0	0	0	100	-	100
	20AC201	Pedagogy Studies							
	20AC202	Stress Management by yoga							
	20AC203	Personality Development through Life Enlightenment Skills							
TOTAL			14	0	12	18	310	490	800

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M.Tech. (VLSI) – R20 COURSE STRUCTURE

(Applicable from the batch admitted during 2020-21 and onwards)

I – Semester									
S. No	Course Code	Subject	Hours Per Week			Credits	Scheme of Evaluation		
			L	T	P		Maximum Marks		
							Int.	Ext.	Tot.
1	20VLPC101	Digital Design and Verification	3	0	0	3	30	70	100
2	20VLPC102	Internet of Things	3	0	0	3	30	70	100
3	Professional Elective-1		3	0	0	3	30	70	100
	20VLPE101	CMOS Mixed Signal Circuit Design							
	20VLPE102	Digital System Design							
	20VLPE103	VLSI Signal Processing							
4	Professional Elective-2		3	0	0	3	30	70	100
	20VLPE104	Modeling and Synthesis with Verilog HDL							
	20VLPE105	CPLD and FPGA Architectures and Applications							
	20VLPE106	CAD of Digital System							
5	20VLPC103	Digital Design and Verification Lab	0	0	4	2	30	70	100
6	20VLPC104	Internet of Things Lab	0	0	4	2	30	70	100
7	20MC101	Research Methodology and IPR	2	0	0	2	30	70	100
8	Audit Course -1		2	0	0	0	100	-	100
	20AC101	English for Research Paper Writing							
	20AC102	Value Education							
	20AC103	Constitution of India							
TOTAL			16	0	8	18	310	490	800

II – Semester (I – Year)									
S. No.	Course Code	Subject	Hours Per Week			Credits	Scheme of Evaluation		
			L	T	P		Maximum Marks		
							Int.	Ext.	Tot.
1	20VLPC201	Analog and Digital CMOS VLSI Design	3	0	0	3	30	70	100
2	20VLPC202	VLSI Design Verification and Testing	3	0	0	3	30	70	100
3	Professional Elective -3		3	0	0	3	30	70	100
	20VLPE201	Memory Technologies							
	20VLPE202	SOC Design							
	20VLPE203	Low power VLSI Design							
4	Professional Elective -4		3	0	0	3	30	70	100
	20VLPE204	Functional Verification using Hardware Verification Languages							
	20VLPE205	MOS Device Modeling and Characterization							
	20VLPE206	Physical Design Automation							
5	20VLPC203	Analog and Digital CMOS VLSI Design Lab	0	0	4	2	30	70	100
6	20VLPC204	VLSI Design Verification and Testing Lab	0	0	4	2	30	70	100
7	20VLPR201	Mini Project with Seminar	0	0	4	2	30	70	100
8	Audit Course -2		2	0	0	0	100	-	100
	20AC201	Pedagogy Studies							
	20AC202	Stress Management by Yoga							
	20AC203	Personality Development through Life Enlightenment Skills							
TOTAL			14	0	12	18	310	490	800

RESEARCH METHODOLOGY AND IPR

I-M.Tech.-I-Sem.

Course Code: 20MC101

L	T	P	C
2	0	0	2

Course Outcomes: At the end of this course, students will be able to

1. formulate research problem
2. analyze research related information
3. follow research ethics
4. perceive nature of IPR and its development
5. Outline the patent rights

UNIT –I:

Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations

UNIT - II:

Effective literature studies approaches, analysis Plagiarism, Research ethics.

UNIT - III:

Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation and assessment by a review committee

UNIT - IV:

Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.

UNIT - V:

Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications.
New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.

References:

1. Stuart Melville and Wayne Goddard, “Research methodology: an introduction for science& engineering students”
2. Wayne Goddard and Stuart Melville, “Research Methodology: An Introduction”
3. Ranjit Kumar, 2nd Edition, “Research Methodology: A Step by Step Guide for beginners”
4. Halbert, “Resisting Intellectual Property”, Taylor & Francis Ltd ,2007.
5. Mayall , “Industrial Design”, McGraw Hill, 1992.
6. Niebel , “Product Design”, McGraw Hill, 1974.
7. Asimov , “Introduction to Design”, Prentice Hall, 1962.
8. Robert P. Merges, Peter S. Menell, Mark A. Lemley, “ Intellectual Property in New Technological Age”, 2016.



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M.Tech. (Computer Science & Engineering) – R22 Course Structure

(Applicable from the batch admitted during 2022-23 and onwards)

I – Semester								
S. No.	Course Code	Subject	POs	PSOs	Hours Per Week			Credits
					L	T	P	
1	22CSPC11	Mathematical Foundations of Computer Science	1,2,3	1,2	3	-	-	3
2	22CSPC12	Advanced Data Structures	1,2,3	1,2	3	-	-	3
3	Professional Elective – I				3	-	-	3
	22CSPE11	Database Programming with PL/SQL	1,2,3	1,2				
	22CSPE12	Deep Learning	1,2,3	1,2				
	22CSPE13	Natural Language Processing	1,2,3	1,2				
4	Professional Elective – II				3	-	-	3
	22CSPE14	Applied Cryptography	1,2,3	1,2				
	22CSPE15	Software Quality Engineering	1,2,3	1,2				
	22CSPE16	Mining Massive Datasets	1,2,3	1,2				
5	22CSPC13	Advanced Data Structures Lab	1,2,3	1,2	-	-	4	2
6	Professional Elective – I Lab				-	-	4	2
	22CSPE17	Database Programming with PL/SQL Lab	1,2,3	1,2				
	22CSPE18	Deep Learning Lab	1,2,3	1,2				
	22CSPE19	Natural Language Processing Lab	1,2,3	1,2				
7	22MC11	Research Methodology & IPR	1,2,3	1,2	2	-	-	2
8	Audit Course -I				2	-	-	0
	22AC11	English for Research Paper Writing	1,2,3					
	22AC12	Disaster Management	1,2,3					
	22AC13	Sanskrit for Technical Knowledge	1,2,3					
	22AC14	Value Education	1,2,3					
TOTAL					16	00	08	18



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

M.Tech. (VLSI) – R22 Course Structure

(Applicable from the batch admitted during 2022-23 and onwards)

I – Semester								
S. No.	Course Code	Subject	POs	PSOs	Hours Per Week			Credits
					L	T	P	
1	22VLPC11	Digital System Design with FPGAs	1,2,3	1,2	3	-	-	3
2	22VLPC12	CMOS Analog IC Design	1,2,3	1,2	3	-	-	3
3	Professional Elective – I				3	-	-	3
	22VLPE11	Pattern Recognition and Machine Learning	1,2,3	1,2				
	22VLPE12	CMOS Mixed Signal Design	1,2,3	1,2				
	22VLPE13	Memory Technologies	1,2,3	1,2				
4	Professional Elective – II				3	-	-	3
	22VLPE14	Communication Buses & Interfaces	1,2,3	1,2				
	22VLPE15	ARM Microcontrollers	1,2,3	1,2				
	22VLPE16	Embedded Real Time Operating System	1,2,3	1,2				
5	22VLPC13	Digital System Design with FPGAs Lab	1,2,3	1,2	-	-	4	2
6	22VLPC14	CMOS Analog IC Design Lab	1,2,3	1,2	-	-	4	2
7	22MC11	Research Methodology & IPR	1,2,3	1,2	2	-	-	2
8	Audit Course -I				2	-	-	0
	22AC11	English for Research Paper Writing	1,2,3					
	22AC12	Disaster Management	1,2,3					
	22AC13	Sanskrit for Technical Knowledge	1,2,3					
	22AC14	Value Education	1,2,3					
TOTAL					16	00	08	18

II – Semester								
S. No.	Course Code	Subject	POs	PSOs	Hours Per Week			Credits
					L	T	P	
1	22VLPC21	Internet of Things	1,2,3	1,2	3	-	-	3
2	22VLPC22	System Verilog Test Benches using UVM	1,2,3	1,2	3	-	-	3
3	Professional Elective – III				3	-	-	3
	22VLPE21	VLSI Advanced Physical Design	1,2,3	1,2				
	22VLPE22	SoC Design	1,2,3	1,2				
	22VLPE23	Design for Testability	1,2,3	1,2				
4	Professional Elective – IV				3	-	-	3
	22VLPE24	Device Modeling	1,2,3	1,2				
	22VLPE25	RFIC Design	1,2,3	1,2				
	22VLPE26	Hardware and Software Co-Design	1,2,3	1,2				
5	22VLPC23	Internet of Things Lab	1,2,3	1,2	-	-	4	2
6	22VLPC24	VLSI Design Verification and Testing Lab	1,2,3	1,2	-	-	4	2
7	22VLPR21	Mini Project with Seminar	1,2,3	1,2	-	-	4	2
8	Audit Course -II				2	-	-	0
	22AC21	Constitution of India	1,2,3					
	22AC22	Pedagogy Studies	1,2,3					
	22AC23	Stress Management by Yoga	1,2,3					
	22AC24	Personality Development Through Life Enlightenment Skills	1,2,3					
TOTAL					14	00	12	20

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

Syllabus

Unit	Title/Topics	Hours
I		9
	Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations	
II		9
	Effective literature studies approaches, analysis, Plagiarism, Research ethics	
III		6+4=10
	Part A: Effective technical writing, how to write report, Paper Developing a Research Proposal	
	Part B: Format of research proposal, a presentation and assessment by a review committee	
IV		9
	Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.	
V		9
	Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications. New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs	
Textbooks		
1. Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science & engineering students"		
2. C.R. Kothari, Research Methodology, methods & techniques, 2nd edition, New age International publishers		
References		
1. Ranjit Kumar, 2nd Edition, "Research Methodology: A Step by Step Guide for beginners"		
2. Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd ,2007.		
3. Mayall, "Industrial Design", McGraw Hill, 1992.		
4. Niebel, "Product Design", McGraw Hill, 1974.		
5. Asimov, "Introduction to Design", Prentice Hall, 1962.		
6. Robert P. Merges, Peter S. Menell, Mark A. Lemley, "Intellectual Property in New Technological Age", 2016.		
7. T. Ramappa, "Intellectual Property Rights Under WTO", S. Chand, 2000		

3 Selvan

Principal

CMR INSTITUTE OF TECHNOLOGY
Master of Business Administration (MBA)- Course Structure: R22

Semester – I						Semester -II					
Course Code	Course Name	L	T	P	C	Course Code	Course Name	L	T	P	C
22MBAPC11	Management and Organizational Behaviour	4	0	0	4	22MBAPC21	Human Resource Management	4	0	0	4
22MBAPC12	Business Economics	4	0	0	4	22MBAPC22	Marketing Management	4	0	0	4
22MBAPC13	Financial Reporting & Analysis	4	0	0	4	22MBAPC23	Financial Management	4	0	0	4
22MBAPC14	Research Methodology and Statistical Analysis	4	0	0	4	22MBAPC24	Quantitative Analysis for Business Decisions	4	0	0	4
22MBAPC15	Legal and Business Environment	4	0	0	4	22MBAPC25	Entrepreneurship and Design Thinking	4	0	0	4
Open Elective – I						Open Elective – II					
22MBAOE11	Business Ethics and Corporate Governance					22MBAOE21	Total Quality Management				
22MBAOE12	Project Management					22MBAOE22	Marketing Research				
22MBAOE13	Sustainability Management					22MBAOE23	International Business				
22MBAOE14	Cross Cultural Management					22MBAOE24	Rural Marketing				
22MBAPR11	Business Communication Lab	-	-	2	2						
22MBAPR12	Statistical Data Analysis Lab	-	-	2	2						
Total						Total					
23						27					
00						00					
04						00					
27						27					
Semester –III						Semester - IV					
Course Code	Course Name	L	T	P	C	Course Code	Course Name	L	T	P	C
22MBAPC31	Production & Operations Management	4	0	0	4	22MBAPC41	Strategic Management	4	0	0	4
22MBAPC32	Management Information Systems	4	0	0	4	Professional Elective – IV					
22MBAPC33	Business Analytics	4	0	0	4	22MBAPE41M	International Marketing				
Professional Elective – I						22MBAPE41H	International Human Resource Management				
22MBAPE31M	Digital Marketing					22MBAPE41F	International Financial Management				
22MBAPE31H	Talent and Performance Management Systems					22MBAPE41E	Entrepreneurial Finance				
22MBAPE31F	Security Analysis and Portfolio Management					Professional Elective – V					
22MBAPE31E	Start-up and MSME Management					22MBAPE42M	Services Marketing	4	0	0	4
Professional Elective – II						22MBAPE42H	Leadership and Change Management				
22MBAPE32M	Sales and Promotion Management					22MBAPE42F	Strategic Financial Management				
22MBAPE32H	Learning and Development					22MBAPE42E	Entrepreneurial Marketing				
22MBAPE32F	Risk Management and Financial Derivatives					Professional Elective – VI					
22MBAPE32E	Technology Business Incubation					22MBAPE43M	Marketing Analytics	4	0	0	4
Professional Elective – III						22MBAPE43H	HR Analytics				
22MBAPE33M	Consumer Behaviour					22MBAPE43F	Financial Analytics				
22MBAPE33H	Employee Relations					22MBAPE43E	Family Business Management				
22MBAPE33F	Strategic Cost and Management Accounting					22MBAPR41	Project: Pre-submission - Seminar	0	0	4	2
22MBAPE33E	Innovation and Entrepreneurship					22MBAPR42	Project: Main Project Viva-Voce	0	0	8	4
22MBAPR31	Summer Internship	0	0	2	2						
Total						Total					
24						16					
00						00					
02						12					
26						22					
Cumulative Credits at the End of Second Year: 102											



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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

Syllabus

Unit	Title/Topics	Hours
I	Introduction to Research	10
Meaning, Scope, Role of Business Research, Types of Research, Research Process, Conceptualization of Variables and Measurement, Types and Measurement of Variables, Ethics in Business Research. Task: Case Study: Online Booking—Has the Time Come?		
II	Research Design	10
Research Problem, Purpose, Types of Research Design: Experimental Research Design, Research Design for Cross Sectional, Longitudinal Studies, Characteristics of Good Research Design, Sampling and its Applications. Data Collection Methods & Tools: Types, Sources and Instruments for Data, Guidelines for Questionnaire, Sampling and its Application. Measurement and Scaling, Reliability and Validity in Measurement of Variables, Sources of Error in Measurement. Task: Case Study: Fortune at the Last Frontier.		
III	Statistical Tests	4+4=8
Part A: Tabulation of Univariate, Bivariate and Multivariate Data: Data Classification and Tabulation, Diagrammatic and Graphical Representation of Data. One-Dimensional, Two-Dimensional and Three-Dimensional Diagrams and Graphs. Introduction to Statistics, Measurement of Central Tendency and Dispersion. Task: Case Study: Keshav Furniture Pvt. Ltd.		
Part B: Small Sample Tests: t-Distribution, Properties and Applications, Testing for One and Two Means, Paired t-Test, Hypothesis Formulation and Testing. Task: Case Study: Tupperware India Pvt. Ltd.		
IV	Variance & Correlation Analysis	10
One-Way and Two-Way ANOVA (with and without Interaction). Chi-Square Distribution: Test for a Specified Population Variance, Test for Goodness of fit, Test for Independence of Attributes. Correlation, Limits for Coefficient of Correlation, Karl Pearson's, Spearman's Rank Correlation, Linear and Multiple Regression Analysis, Discriminant Analysis, Exploratory Factor Analysis. Task: Case Study: Mehta Garment Company		
V	Time Series Analysis and Report Writing	10
Components, Models of Time Series, Additive, Multiplicative and Mixed Models, Trend Analysis: Free hand Curve, Semi Averages, Moving Averages, Least Square Methods. Index Numbers: Characteristics and Uses, Types, Unweighted Price Indexes, Weighted Price Indexes, Tests of Adequacy and Consumer Price Indexes. Importance of Report writing, Types of Research Reports, Report Preparation and Presentation, Report Structure, Report Formulation, Guides for Effective Documentation, Research Briefings. Referencing Styles and Citation. Task: Case Study: Herbal Tooth Powder		
Textbooks		
1. Deepak Chawla, Research Methodology: Concepts & Cases, Vikas Publishing, 2e, 2016. 2. Ranjit Kumar, Research Methodology: Step-by-step Guide for Beginners, sage, 4e, 2022.		



PROFORMA INVOICE

Pinnacle Nanotech India Pvt. Ltd. #11-8-237/4/204, C S Nilayam, Kranthi Nagar Colony, Saroornagar, Hyderabad-500035 info@pinnacledenanotech.com		Pro Invoice No.: HYD 18010		Dt: 17/09/2018	
		Buyers Order No & Date:		CMRIT/PO/05/2018 04.09.2018	
Buyer: C M R Institute of Technology, Kandlakoya, Medchal Road, Hyderabad - 501 401		Terms of Delivery:			
Sr. No.	Description of Goods	Qty	Rate	Per	Amount
1	DrillBit Extreme Anti Plagiarism Software Unlimited pages and 500 number of uploads (1 Year Lic)	1	44,500	No.	44,500.00
	CGST@9 %				4,005.00
	SGST@9 %				4,005.00
	Total				52,510.00
Amount Chargeable (In Words): Fifty Two Thousand Five Hundred and Ten Rupees Only Company's CIN: U72200TG2009PTC065627 Company's GSTIN: 36AAF4375H1Z7 Company's PAN: AAF4375H Company's TAN: HYDP06686B Company's IEC: 0916504328 Declaration: We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct. E & O.E					
Bank Details for RTGS/NEFT: PINNACLE NANOTECH INDIA PVT LTD, A/c No: 31224292839, IFSC Code: SBIN0011666, State Bank of India, RAMAKRISHNAPURAM Branch, Hyderabad.					

For PINNACLE NANOTECH INDIA PVT LTD.



(Authorized Signatory)

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

Reg Office: #11-8-237/204, Flat No.204, CS Nilayam, Kranthi Nagar Colony, Saroor Nagar, Ranga Reddy, Hyderabad, Telangana – 500 03

Corporate Office: # Plot No.: 7-145, Opp IDBI Bank, Habsiguda, Hyderabad - 500 007, Telangana

Ph: 040-4260 6941, E-Mail: info@pinnacledenanotech.com, URL: www.pinnacledenanotech.com

PROFORMA INVOICE

Pinnacle Nanotech India Pvt. Ltd. #11-8-237/4/204, C S Nilayam, Kranthi Nagar Colony, Saroornagar, Hyderabad-500035 info@pinnacledenanotech.com		Pro Invoice No.: HYD 19004		Dt:23/07/2019	
		Buyers Order No & Date:		CMRIT/PO/16/2019 22.07.2019	
Buyer: CMR Institute of Technology, Kandlakoya, Medchal Road, Hyderabad - 501 401		Terms of Delivery:			
Sr. No.	Description of Goods	Qty	Rate	Per	Amount
1	DrillBit Extreme Anti Plagiarism Software Unlimited pages and 500 number of uploads (1 Year Lic)	1	44,500	No.	44,500.00
					CGST@9 % 4,005.00 SGST@9 % 4,005.00
	Total				52,510.00
Amount Chargeable (In Words): Fifty Two Thousand Five Hundred and Ten Rupees Only					
Company's CIN: U72200TG2009PTC065627 Company's GSTIN: 36AAF4375H1Z7 Company's PAN: AAF4375H Company's TAN: HYDP06686B Company's IEC: 0916504328 Declaration: We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct. E & O.E					
Bank Details for RTGS/NEFT: PINNACLE NANOTECH INDIA PVT LTD, A/c No: 31224292839, IFSC Code: SBIN0011666, State Bank of India, RAMAKRISHNAPURAM Branch, Hyderabad.					

For PINNACLE NANOTECH INDIA PVT LTD.

(Authorized Signatory)



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

TAX INVOICE

ORIGINAL FOR RECIPIENT



Invoice No. : INV/TS/21033
 Invoice Date : 25/08/2021
 Reference No : -
 Place of supply : 36-Telangana
 Due Date : 31/08/2021

From
Pinnacle Nanotech India Pvt Ltd
 # 11-8-237/4/204, C S Nilayam, Kranthi Nagar Colony,
 Saroornagar,, Hyderabad, Telangana 500035
 GSTIN 36AAFCP4375H1Z7
 PAN AAFCP4375H

Billing Address
CMR Institute of Technology
 Kandlakoya Village, Medchal Road, Hyderabad, Telangana
 501401, Telangana

Shipping Address
CMR Institute of Technology
 Kandlakoya Village, Medchal Road, Hyderabad, Telangana
 501401, Telangana

#	Description	HSN / SAC	Qty	Rate / Unit	Taxable Value	CGST	SGST / UTGST	Total Amount
1	DrillBit Extreme Plagiarism Detection Software - 500 Document Submissions one user account 12 months Annual Subscription Cloud-Based Anti-Plagiarism Software Service	997331	1.00 UNT	42,373.00	42,373.00	3,813.57 (9%)	3,813.57 (9%)	50,000.14
TOTAL (₹)					42,373.00	3,813.57	3,813.57	50,000.14

Bank Details:

Account Number : 1443280000000819 IFSC : KVBL0001443
 Bank Name : Karur Vysya Bank Branch Name : ABIDS, Hyderabad

Taxable Amount ₹ 42,373.00
 Total Tax ₹ 7,627.14
 Rounding Off ₹ (0.14)

Total amount (in words) **Fifty Thousand Rupees Only**

Total Amount ₹ 50,000.00

Terms & Conditions:

1. We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.
2. Subject to Hyderabad Jurisdiction.
3. Interest will be Charged @18% if not paid with in due date
4. TDS Not Applicable NOTIFICATION NO. 21/2012 S.O. 1323(E), DATED 13-6-2012

Pinnacle Nanotech India Pvt Ltd



Authorised Signatory

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

TAX INVOICE

ORIGINAL FOR RECIPIENT



From
Pinnacle Nanotech India Pvt Ltd
 # 11-8-237/4/204, C S Nilayam, Kranthi Nagar Colony,
 Saroornagar,, Hyderabad, Telangana 500035
 GSTIN 36AAFCP4375H1Z7
 PAN AAFCP4375H

Invoice No. : INV/TS/22079
 Invoice Date : 28/02/2023
 Reference No : CMRIT/PO/Drill
 Bit/01/2023, Dt:
 30/01/2023
 Place of supply : 36-Telangana
 Due Date : -

Billing Address
CMR Institute of Technology
 Kandlakoya Village, Medchal Road, Hyderabad, Telangana
 501401, Telangana

Shipping Address
CMR Institute of Technology
 Kandlakoya Village, Medchal Road, Hyderabad, Telangana
 501401, Telangana

#	Description	HSN / SAC	Qty	Rate / Unit	Taxable Value	CGST	SGST / UTGST	Total Amount
1	DrillBit Extreme Plagiarism Detection Software - 500 Document Submissions one user account 12 months Annual Subscription Cloud-Based Anti-Plagiarism Software Service	997331	1.00 UNT	50,000.00	50,000.00	4,500.00 (9%)	4,500.00 (9%)	59,000.00
TOTAL (₹)					50,000.00	4,500.00	4,500.00	59,000.00

Bank Details:
 Account Number : 386605001771 IFSC : ICIC0003866
 Bank Name : ICICI BANK Branch Name : Hastinapur, Hyderabad

Taxable Amount ₹ 50,000.00
 Total Tax ₹ 9,000.00

Total amount (in words) **Fifty Nine Thousand Rupees Only**

Total Amount ₹ 59,000.00

Terms & Conditions:
 1. We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.
 2. Subject to Hyderabad Jurisdiction.
 3. Interest will be Charged @18% if not paid with in due date
 4. TDS Not Applicable NOTIFICATION NO. 21/2012 S.O. 1323(E), DATED 13-6-2012

Pinnacle Nanotech India Pvt Ltd

 Authorised Signatory

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