Course Outcomes, CO-PO

&

CO-PSO MAPPING

For JNTUA

REGULATION – R21

M.TECH

-

VLSI

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(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

M.TECH. IN VLSI/VLSI DESIGN/VLSI YSTEM DESIGN

COMMON COURSE STRUCTURE & SYLLABI

SEMESTER – I

S. No.	Course codes	Course Name	Category	Hours per week			Credits
				L	T	P	
1.	21D57101	CMOS Analog IC Design	PC	3	0	0	3
2.	21D57102	CMOS Digital IC Design	PC	3	0	0	3
3.	21D57103a 21D57103b 21D57103c	**Program Elective – 1** Microchip Fabrication Techniques Nanomaterials and Nanotechnology CAD for VLSI	PE	3	0	0	3
4.	21D57104a 21D57104b 21D57104c	**Program Elective – 1** Device Modelling FPGA Architectures and Applications ASIC Design	PE	3	0	0	3
5.	21D57105	CMOS Analog IC Design Lab	PC	0	0	4	2
6.	21D57106	CMOS Digital IC Design Lab	PC	0	0	4	2
7.	21DRM101	Research Methodology and IPR	MC	2	0	0	2
8.	21DAC101a 21DAC101b 21DAC101c	**Audit Course – I** English for Research paper writing Disaster Management Sanskrit for Technical Knowledge	AC	2	0	0	0
Total							18

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COMMON COURSE STRUCTURE & SYLLABI

SEMESTER – II

S.No.	Course codes	Course Name	Category	Hours per week			Credits
				L	T	P	
1.	21D57201	CMOS Mixed Signal IC Design	PC	3	0	0	3
2.	21D57202	Physical Design Automation	PC	3	0	0	3
3.	21D57203a 21D57203b 21D57203c	**Program Elective – III** SoC Testing and Verification Semiconductor Memory Design and Testing MEMS System Design	PE	3	0	0	3
4.	21D57204a 21D57204b 21D57204c	**Program Elective – IV** Low Power VLSI Design IoT and its Applications VLSI Signal Processing	PE	3	0	0	3
5.	21D57205	CMOS Mixed Signal IC Design Lab	PC	0	0	4	2
6.	21D57206	Physical Design Automation Lab	PC	0	0	4	2
7.	21D57207	Technical seminar	PR	0	0	4	2
8.	21DAC201a 21DAC201b 21DAC201c	**Audit Course – II** Pedagogy Studies Stress Management for Yoga Personality Development through Life Enlightenment Skills	AC	2	0	0	0
		Total					18

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M.TECH. IN VLSI/VLSI DESIGN/VLSI YSTEM DESIGN
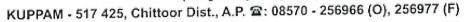
COMMON COURSE STRUCTURE & SYLLABI

SEMSTER - III

S.No.	Course codes	Course Name	Category	Hours per L	T	P	Credits
1.	21D57301a 21D57301b 21D06203a	**Program Elective – V** Bi-CMOS Technology and Applications Optimization Techniques and Applications in VLSI Design SoC Architecture	PE	3	0	0	3
2.	21DOE301b 21DOE301c 21DOE301e	**Open Elective** Industrial Safety Business Analytics Waste to Energy	OE	3	0	0	3
3.	21D57302	Dissertation Phase – I	PR	0	0	20	10
4.	21D57303	Co-curricular Activities					2
Total							**18**

SEMESTER - IV

S.No.	Course codes	Course Name	Category	Hours per L	T	P	Credits
1.	21D57401	Dissertation Phase – II	PR	0	0	32	16
Total							**16**

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-I

Subject Code: 21D57101
Subject Name: CMOS ANALOG IC Design

Course Outcomes:

1. Design MOSFET based analog integrated circuits.

2. Analyze analog circuits at least to the first order.

3. Appreciate the trade-offs involved in analog integrated circuit design.

4. Understand and appreciate the importance of noise and distortion in analog circuits.

5. Analyze complex engineering problems critically in the domain of analog IC design for conducting research.

6. Solve engineering problems for feasible and optimal solutions in the core area

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	2	3	3	
CO2	3	2	3	3	
CO3	3	3	3	3	
CO4	2	3	3	3	2
CO5	3	3			
CO6	3	2			
Average	3	2	3	3	2

Program Coordinator

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-I

Subject Code: 21D57102
Subject Name: CMOS DIGITAL IC DESIGN

Course Outcomes:

1. Demonstrate advanced knowledge in Static and dynamic characteristics of CMOS,

2. Estimate Delay and Power of Adders circuits.

3. Classify different semiconductor memories.

4. Analyze, design and implement combinational and sequential MOS logic circuits.

5. Analyze complex engineering problems critically in the domain of digital IC design for conducting research.

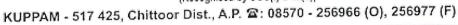6. Solve engineering problems for feasible and optimal solutions in the core area of digital ICs

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	3	2		
CO2	3	3	2	2	2
CO3	3	3	2	2	2
CO4	3	3	2	1	2
CO5	3	3	2	2	3
CO6	2	2	2		3
Average	3	3	2	2	2

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-I

Subject Code: 21D57103C
Subject Name: CAD FOR VLSI

Course Outcomes:

1. Establish comprehensive understanding of the various phases of CAD for digital electronic systems, from digital logic simulation to physical design, including test and verification.
2. Demonstrate knowledge and understanding of fundamental concepts in CAD and to establish capability for CAD tool development and enhancement.
3. Practice the application of fundamentals of VLSI technologies
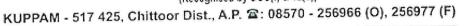4. Optimize the implemented design for area, timing and power by applying suitable constraints

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	3		3	
CO2	3	3	3	2	2
CO3	3				2
CO4	3	3	3	2	1
Average	3	3	3	2.5	1.5

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-I
AND
ONS

Subject Code: 21D57104b
Subject Name: FPGA ARCHITECTURES APPLICATI

Course Outcomes:

1. Acquire knowledge about various architectures and device technologies of PLD's.

2. Comprehend FPGA Architectures.

3. Analyze System level Design and their application for Combinational and Sequential Circuits.

4. Familiarize with Anti-Fuse Programmed FPGAs

5. Apply knowledge of this subject for various design applications

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3		3		
CO2	3	1	3		
CO3	2		3	2	
CO4	2	2	3		2
CO5	2	1	2		2
Average	2.5	1.5	3	1	1

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-I

Subject Code: 21D57105
Subject Name: CMOS ANALOG IC DESIGN LAB

Course Outcomes:

1. Explain the VLSI Design Methodologies using VLSI design tool.
2. Grasp the significance of various CMOS analog circuits in full-custom IC Design flow
3. Explain the Physical Verification in Layout Design
4. Fully appreciate the design and analyze of analog and mixed signal simulation

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	2	2	3	3
CO2	3	2	3	3	
CO3	3	3	3	2	
CO4	2	3	3	2	
CO5	3				
Average	3	2.5	3	2.5	1

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-I

Subject Code: 21D57106
Subject Name: CMOS DIGITAL IC LABORATORY

Course Outcomes:

1. Explain the VLSI Design Methodologies using any VLSI design tool.
2. Grasp the significance of various design logic Circuits in full-custom IC Design.
3. Explain the Physical Verification in Layout Extraction.
4. Fully appreciate the design and analyze of CMOS Digital Circuits.
5. Grasp the Significance of Pre-Layout Simulation and Post-Layout Simulation.

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	2	3	2	3	2
CO2	3	3	3	3	3
CO3	2	3	2	3	2
CO4	3	2	3	3	3
CO5					
Average	2.5	2.8	2.5	3	2.5

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-I Year

Subject Code: 21DRM101
Subject Name: RESEARCH METHODOLOGY AND IPR

Course Outcomes:

1. Analyze research related information

2. Follow research ethics

3. Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.

4. Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.

5. Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	2	2	3		2
CO2	2	2	2		2
CO3	3	3	3		3
CO4	3	2	2	3	3
CO5	3	2			
Average	2.6	2.2	2.5	3	2.5

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-I Year

Subject Code: 21DAC101a
Subject Name: ENGLISH FOR RESEARCH WRITING

Course Outcomes:

1. Understand the significance of writing skills and the level of readability
2. Analyze and write title, abstract, different sections in research paper
3. Develop the skills needed while writing a research paper

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	2	3	2	3	2
CO2	3	3	3	3	3
CO3	2	3	2	3	2
Average	2.4	3	2.4	3	2.4

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-II

Subject Code: 21D57201
Subject Name: CMOS MIXED SIGNAL IC Design

Course Outcomes:

1. Demonstrate first order filter with least interference
2. Extend the concept of phase locked loop for designing PLL application with minimum jitterby considering non ideal effects.
3. Design different A/D, D/A, modulators, demodulators and different filter for real timeapplications

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	2	2		
CO2	3	2	3		2
CO3	3	3	3	3	1
Average	3	2.4	2.8	3	1.5

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21

Year & Sem: I-II

Subject Code: 21D57202

Subject Name: PHYSICAL DESIGN AUTOMATION

Course Outcomes:

1. Understand relation between automation algorithms and constraints posed by VLSItechnology.
2. Adopt algorithms to meet critical design parameters.
3. Design area efficient logics by employing different routing algorithms and shape functions.
4. Simulate and synthesis different combinational and sequential logics.

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	3		3	
CO2	3	3	3	2	2
CO3	3	3	2	2	2
CO4	3	3	3	1	1
Average	3	3	2.7	2.7	1.7

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-II

Subject Code: 21D57203a
Subject Name: SOC TESTING AND VERIFICATION

Course Outcomes:

1. Understand the concepts of faults and testing in SoC

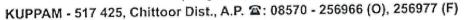2. Implement the faults using simulation tools

3. Analyze BIST systems

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	3	3	3	3
CO2	3	3	3	2	2
CO3	3			1	
Average	3	3	3	2	2.5

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21

Year & Sem: I-II

Subject Code: 21D57204b

Subject Name: IOT AND ITS APPLICATIONS

Course Outcomes:

1. Apply the Knowledge in IOT Technologies and Data management.
2. Determine the values chains Perspective of M2M to IOT.
3. Implement the state of the Architecture of an IOT.
4. Compare IOT Applications in Industrial & real world.
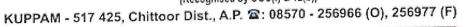5. Demonstrate knowledge and understand the security and ethical issues of an IOT.

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3		2	3	
CO2	3	1	2	2	3
CO3	2		2	2	2
CO4	2	2			
CO5	2	1	2		2
Average	2.5	1.4	2	2.5	2.5

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-II

Subject Code: 21D57205
Subject Name: CMOS MIXED SIGNAL IC DESIGN LAB

Course Outcomes:

1. Design and simulate op-amp for given specifications
2. Design and simulate data converter for given specifications
3. Design and simulate PLL and VCO for given specifications
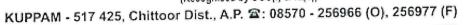4. Understand the Significance of Pre-Layout Simulation and Post-Layout Simulation.

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	2	3	3	3
CO2	3	2	3		2
CO3	3	3	3	3	3
CO4	2	3	2	2	3
Average	2.8	2.5	2.8	2.7	2.8

Program Coordinator

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-II

Subject Code: 21D57206
Subject Name: PHYSICAL DESIGN AUTOMATION LABORATORY

Course Outcomes:

1. Learn the implementation of different Physical Design Automation algorithms
2. Implement different graph algorithms
3. Implement different partitioning algorithms
4. Implement different floor planning algorithms
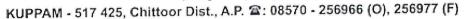5. Implement different routing algorithms.

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	3	2	3	2
CO2	3	3	3	2	3
CO3	2	3	2	2	2
CO4	3	2	3		3
CO5	2	3	3		2
Average	3	2.8	2.5	3	2.5

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: I-II

Subject Code: 21DAC201c
Subject Name: PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTMENT SKILLS WRITING

Course Outcomes:

1. Studyof Shrimad-Bhagwad-Geeta will help the student in developing his personalityand achievethe highest goal in life

2. The person who has studied Geeta will lead the nation and mankind to peace and prosperity

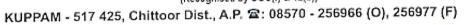3. Study of Neetishatakam will help in developing versatile personality of students

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	2	3	2	3	2
CO2	3	3	3	3	3
CO3	2	3	2	3	2
CO4	3	2	3	3	3
Average	2.5	2.8	2.5	3	2.5

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: II-III

Subject Code: 21D57301a
Subject Name: BI-CMOS TECHNOLOGY AND APPLICATIONS

Course Outcomes:

1. Demonstrate in-depth knowledge in Bi-CMOS Technology.
2. Analyze complex engineering problems critically for conducting research in BiCMOS Technology.
3. Solve engineering problems with wide range of solutions in Radio Frequency Integratedcircuits.
4. Realize different digital circuits using Bi-CMOS Technology

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	2	3	3	
CO2	3	2	3	3	
CO3	3	3	3	3	
CO4	2	3	3	3	2
Average	2.8	2.5	3	3	2

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KUPPAM ENGINEERING COLLEGE
KUPPAM - 517 425

KUPPAM ENGINEERING COLLEGE

(Approved by AICTE, Affiliated to JNTUA, Accredited by NAAC, NBA & ISO 9001 : 2008 Certified)

(Recognised by UGC(f) & 12(b))

KUPPAM - 517 425, Chittoor Dist., A.P. ☎: 08570 - 256966 (O), 256977 (F)

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: II-III

Subject Code: 21DOE301c
Subject Name: BUISNESS ANALYTICS

Course Outcomes:

1. Students will demonstrate knowledge of data analytics.

2. Students will demonstrate the ability of think critically in making decisions based on data and deep analytics.

3. Students will demonstrate the ability to use technical skills in predicative and prescriptive modeling to support business decision-making.

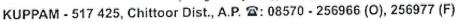4. Students will demonstrate the ability to translate data into clear, actionable insights.

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	3	3		
CO2	3	3	3	2	1
CO3	3	3	2	2	1
CO4	3	3	3	1	1
Average	3	3	2.8	1.7	1

Program Coordinator

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COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: II-III

Subject Code: 21D57302
Subject Name: DISSERATION PHASE-I

Course Outcomes:

1. Identify problems that have relevance to societal / industrial needs

2. Exhibit independent thinking and analysis skills

3. Demonstrate the application of relevant science / engineering principles

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	3	3		1
CO2	3	3	3	2	2
CO3	3		3	2	
CO4	3	3	3	2	1
Average	3	3	3	2	1.4

Program Coordinator

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES, CO-PO AND CO-PSO MAPPING

Regulation: R21
Year & Sem: II-IV

Subject Code: 21D57401
Subject Name: DISSERATION PHASE-II

Course Outcomes:

1. Identify problems that have relevance to societal / industrial needs

2. Exhibit independent thinking and analysis skills

3. Demonstrate the application of relevant science / engineering principles

CO_ PO and PSO mapping correlation

CO	PO1	PO2	PO3	PSO1	PSO2
CO1	3	3	3		1
CO2	3	3	3	2	2
CO3	3		3	2	
CO4	3	3	3	2	1
Average	3	3	3	2	1.4

Program Coordinator

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