



AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Approved by A.I.C.T.E., New Delhi, & Permanently Affiliated to J.N.T.U-GV, Vizianagaram)

NAAC "B++" Accredited Institute

Cherukupally (Village), Near Tagarapuvalasa Bridge, Vizianagaram (Dist) -531162.

www.aietta.ac.in, principal@aietta.ac.in

Department of Electronics and Communication Engineering

Program: M.Tech VLSI-Design Course Outcomes

Regulation: R19

Course Outcomes

No. of Courses: 41

I-Sem	Course:CMOS Analog IC Design
CO-1	Design MOSFET based analog integrated circuits.
CO-2	Analyze analog circuits at least to the first order.
CO-3	Appreciate the trade-offs involved in analog integrated circuit design
CO-4	Understand and appreciate the importance of noise and distortion in analog circuits
CO-5	Analyze complex engineering problems critically in the domain of analog IC design for conducting research
I-Sem	Course:CMOS Digital IC design
CO-1	Demonstrate advanced knowledge in Static and dynamic characteristics of CMOS, Alternative CMOS Logics, Estimation of Delay and Power, Adders Design
CO-2	Classify different semiconductor memories.
CO-3	Analyze, design and implement combinational and sequential MOS logic circuits.
CO-4	Analyze complex engineering problems critically in the domain of digital IC design for conducting research
CO-5	Solve engineering problems for feasible and optimal solutions in the core area of digital ICs
I-Sem	Course:VLSI Technology
CO-1	Understand the basics of MOS transistors and also the characteristics of MOS transistors.
CO-2	Learn about the MOS fabrication process and short channel effects.
CO-3	Learn about the basic rules in layout designing.
CO-4	Analyse various combinational logic networks and sequential systems.
CO-5	Learn about Sequential Systems
I-Sem	Course:Nanomaterials and Nano Technology
CO-1	To understand the basic science behind the design and fabrication of nano scale systems.
CO-2	To understand and formulate new engineering solutions for current problems and competing technologies for future applications.
CO-3	To be able make inter disciplinary projects applicable to wide areas by clearing and



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	fixing the boundaries in system development.
CO-4	To gather detailed knowledge of the operation of fabrication and characterization devices to achieve precisely designed systems
CO-5	To understand the concept of Ferroelectric Materials
I-Sem Course:MEMS Technology	
CO-1	To understand the basic concepts of MEMS technology and working of MEMS devices.
CO-2	To understand and selecting different materials for current MEMS devices and competing Technologies for future applications
CO-3	To understanding the concepts of fabrication process of MEMS, Design and Packaging Methodology.
CO-4	To analyze the various fabrication techniques in the manufacturing of MEMS Devices
CO-5	Understanding steps involved in Fabricating devices
I-Sem Course:Device Modelling	
CO-1	To understand the physics of 2-terminal MOS operation and its characteristics
CO-2	To understand the physics of C-V characteristics
CO-3	To understand the physics of 4-terminal MOSFET operation and its characteristics
CO-4	To understand the physics of Sub threshold current model
CO-5	To analyze the SOI MOSFET electrical characteristics
I-Sem Course:Nano-electronics	
CO-1	To understand and challenges due to scaling on CMOS devices
CO-2	To analyze and explain working of novel MOS based silicon devices and various multi gate devices
CO-3	To understand working of spin electronic devices
CO-4	To understand nano electronic systems and building blocks low dimensional semiconductors, heterostructures, carbon nanotubes, quantum dots, nano wires etc.
CO-5	Understand the concept of Electronic Noises
I-Sem Course:Photonics	
CO-1	Classify the Optical sources and detectors and to discuss their principle
CO-2	Familiar with Design considerations of fiber optic systems.



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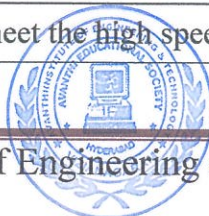
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CO-3	To perform characteristics of optical fiber, sources and detectors, design as well as conduct experiments in software and hardware, analyze the results to provide valid conclusions
CO-4	Apply the principles of atomic physics to materials used in optics and photonics; calculate properties of and design modern optical fibres and photonic crystals.
CO-5	Use the tools, methodologies, language and conventions of physics to test and communicate ideas and explanations.
I-Sem	Course: Research Methodology and IPR
CO-1	Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.
CO-2	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.
CO-3	Analyze research related information
CO-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.
CO-5	Understand research problem formulation.
I-Sem	Course: CMOS Analog IC Design Lab
CO-1	Fully Appreciate the design and analyze of analog and mixed signal simulation
CO-2	Grasp the Significance of Pre-Layout Simulation and Post-Layout Simulation
CO-3	Grasp the significance of various cmos analog circuits in full-custom IC Design flow
I-Sem	Course: CMOS Digital IC design Lab
CO -1	Have the ability to explain the VLSI Design Methodologies using Mentor Graphics Tools
CO-2	Grasp the significance of various design logic Circuits in full-custom IC Design.
CO-3	Have the ability to explain the Physical Verification in Layout Extraction
II-Sem	Course: Mixed Signal & RF IC Design
CO -1	Design basic cells like Op-Amp, against process and temperature variations meeting the mixed signal specifications
CO -2	Design comparators that can meet the high speed requirements of digital circuitry.





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CO -3	Design a complete mixed signal system that includes efficient data conversion and RF circuits with minimizing switching.
CO -4	Understand the design bottlenecks specific to RF IC design, linearity related issues and ISI
CO -5	Comprehend different multiple access techniques, wireless standards and various transceiver architectures
II-Sem Course:Physical Design Automation	
CO -1	Understand the relationship between design automation algorithms and Various constraints posed by VLSI fabrication and design technology.
CO -2	Understand the relationship between design automation algorithms and Various constraints posed by VLSI fabrication and design technology.
CO -3	Identify layout optimization techniques and map them to the algorithms
CO -4	Develop proto-type EDA tool and test its efficacy
CO -5	Understanding the concept of Partitioning algorithms
II-Sem Course:Design for Testability	
CO -1	Demonstrate advanced knowledge in The basic faults that occur in digital systems, Testing of stuck at faults for digital circuits, Design for testability
CO -2	Analyze testing issues in the field of digital system design critically for conducting research.
CO -3	Solve engineering problems by modeling different faults for fault free simulation in digital circuits.
CO -4	Apply appropriate research methodologies and techniques to develop new testing strategies for digital and mixed signal circuits and systems.
CO -5	Understand concept of Motivation, System Configuration with Boundary Scan
II-Sem Course:IOT and its Applications	
CO-1	Apply the Knowledge in IOT Technologies and Data management.
CO-2	Determine the values chains Perspective of M2M to IOT.
CO-3	Implement the state of the Architecture of an IOT.
CO-4	Compare IOT Applications in Industrial & real world
CO-5	Demonstrate knowledge and understanding the security and ethical issues of an IOT.
II-Sem Course:VLSI Signal Processing	
CO -1	Ability to modify the existing or new DSP architectures suitable for VLSI





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CO -2	Understand the concepts of folding and unfolding algorithms and applications.
CO -3	Ability to implement fast convolution algorithms
CO-4	Understand the concept of fast convolution
CO-5	Low power design aspects of processors for signal processing and wireless applications
II-Sem Course:Network Security and Cryptography	
CO -1	Identify and utilize different forms of cryptography techniques
CO -2	Incorporate authentication and security in the network applications
CO -3	Distinguish among different types of threats to the system and handle the same
CO-4	Understand authentication and security
CO-5	Understanding the concept of system security
II-Sem Course:Microcontrollers and Programmable Digital Signal Processors	
CO -1	Compare and select ARM processor core based SoC with several features/peripherals based on requirements of embedded applications
CO -2	Identify and characterize architecture of Programmable DSP Processors
CO -3	Develop small applications by utilizing the ARM processor core and DSP processor based platform.
CO-4	Understand Programmable DSP (P-DSP) Processors
CO-5	Understand VLIW architecture and TMS320C6000 series, architecture study
II-Sem Course:Low Power Vlsi Design	
CO -1	Identify the sources of power dissipation in digital IC systems & understand the impact of power on system performance and reliability
CO -2	Characterize and model power consumption & understand the basic analysis methods.
CO -3	Understand leakage sources and reduction techniques
CO-4	Understand Fabrication of Multiple Threshold Voltages, Multiple Channel Doping
CO-5	Understand Low power clock distribution & Simulation Power Analysis
II-Sem Course:Mixed Signal IC Design Lab	
CO -1	Gain knowledge Mentor Graphics/ Cadence Equivalent Standard Software Tool
CO -2	Tanner / Industry Equivalent Standard Software Tool



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CO -3	Personal Computer with necessary peripherals, configuration and operating System
II-Sem	
Course:Physical Design Automation Lab	
CO -1	Gain Fluency in Graph Algorithms and Computational geometry algorithm
CO -2	Gain fluency in Partitioning and Floor Planning algorithms
CO -3	Gain knowledge about Routing algorithms
II-Sem	
Course: Mini Project	
CO -1	Understand of contemporary / emerging technology for various processes and systems
CO-2	Share knowledge effectively in oral and written form and formulate documents
III-Sem	
Course:Scripting Languages for VLSI	
CO -1	Gain fluency in programming with scripting languages
CO -2	Create and run scripts using PERL/TCL/PYTHON in CAD Tools
CO -3	Demonstrate the use of PERL/PYTHON/ TCL in developing system and web applications
CO-4	Use Advanced TCL
CO-5	Gain fluency in Python Programming language
III-Sem	
Course:Digital Design and Verification	
CO -1	Familiarity of Front end design and verification techniques and create reusable test environments
CO -2	Verify increasingly complex designs more efficiently and effectively.
CO -3	Use EDA tools like Cadence, Mentor Graphics.
CO-4	Understand Current challenges in physical design
CO-5	Use Programmable Logic Devices
III-Sem	
Course:Hardware Software Co-Design	
CO -1	About the Hardware-Software Code sign Methodology.
CO -2	How to select a target architecture and how a prototype is built and how emulation of a prototype is done.
CO -3	Brief view about compilation technologies and compiler development environment.



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CO -4	Understand the importance of system level specification languages and multi-language cosimulation.
CO -5	Understand Languages for System-Level Specification and Design-I
III-Sem	Course:(Dissertation) Dissertation Phase – I and phase – II
CO-1	Ability to synthesize knowledge and skills previously gained and applied to an in-depth study and execution of new technical problem
CO-2	Capable to select from different methodologies, methods and forms of analysis to produce a suitable research design, and justify their design
CO-3	Ability to present the findings of their technical solution in a written report.
CO-4	Presenting the work in International/ National conference or reputed journals.
CO-5	Research and development in various domain
III-Sem	Course:Business Analytics
CO-1	Students will demonstrate knowledge of data analytics.
CO-2	Students will demonstrate the ability of think critically in making decisions based on data and deep analytics
CO-3	Students will demonstrate the ability to use technical skills in predicative and prescriptive modeling to support business decision-making
CO-4	Students will demonstrate the ability to translate data into clear, actionable insights
CO-5	Student can analyze the decisions
III-Sem	Course:Industrial Safety
CO -1	Basic Knowledge of Industrial Safety
CO -2	Understand the concept Fundamentals of maintenance engineering
CO -3	Understanding Wear and Corrosion and their prevention
CO -4	Understand the concept Fault tracing
CO -5	Understand Periodic and preventive maintenance
III-Sem	Course:Operations Research
CO -1	Students should able to apply the dynamic programming to solve problems of discreet and continuous variables.
CO -2	Students should able to apply the dynamic programming to solve problems of discreet and continuous variables.
CO -3	Students should able to apply the dynamic programming to solve problems of discreet and continuous variables.



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CO -4	Student should able to model the real world problem and simulate it.
CO -5	Student should able to solve Single and Multi-Channel Problems
III-Sem Course:Cost Management of Engineering Projects	
CO -1	Understand the concept of strategic cost management, strategic cost analysis – target costing, life cycle costing and Kaizen costing and the cost drive concept.
CO -2	Describe the decision-making; relevant cost, differential cost, incremental cost and opportunity cost, objectives of a costing system.
CO -3	Understand the meaning and different types of project management and project execution, detailed engineering activities.
CO -4	Understand the project contracts, cost behaviour and profit planning types and contents, Bar charts and Network diagram.
CO -5	Analyse by using quantitative techniques for cost management like PERT/CPM.
III-Sem Course:Composite Materials	
CO -1	Understand the concept of Composite materials
CO -2	Detail about the Reinforcements
CO -3	Understand Manufacturing of Metal Matrix Composites
CO -4	Understand Manufacturing of Polymer Matrix
CO -5	Understand the concept of Laminar Failure Criteria-strength ratio
III-Sem Course:Waste To Energy	
CO -1	Student can Classify waste as fuel
CO -2	Student can understand concept of biomass Pyrolysis
CO -3	Understand the concept of Biomass Gasification
CO -4	Understand the concept of Biomass Combustion
CO -5	Understand the concept of Biogas
III-Sem Course:Audit 1 and 2: English For Research Paper Writing	
CO -1	Students can improve writing skills
CO -2	Student can clarify who did what
CO -3	Review of the Literature
CO -4	Student get to know what to write in which section



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CO -5	Student can improve writing the conclusion
CO-6	Student can able to improve selection of phrases
III-Sem	Course:Audit 1 and 2: Disaster Management
CO -1	Brief knowledge of the disasters
CO -2	Understand Repercussions Of Disasters And Hazards
CO -3	Study Of Seismic Zones
CO -4	Student will able to know Disaster Preparedness And Management
CO -5	Student will able to know the measure to be take in a risky situation
CO-6	Student will able to know concepts of disaster mitigation
III-Sem	Course: Audit 1 and 2: Sanskrit For Technical Knowledge
CO-1	Understanding basic Sanskrit language
CO-2	Ancient Sanskrit literature about science & technology can be understood
CO-3	Being a logical language will help to develop logic in students
III-Sem	Course:Audit 1 and 2: Value Education
CO-1	Knowledge of self-development
CO-2	Learn the importance of Human values
CO-3	Developing the overall personality
CO-4	Student will able to know about the importance of character
III-Sem	Course:Audit 1 and 2: Constitution of India
CO -1	Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
CO -2	Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India
CO -3	Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
CO -4	Discuss the passage of the Hindu Code Bill of 1956
CO -5	To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution



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CO- 6	To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism
III-Sem	Course:Audit 1 and 2: Pedagogy Studies
CO -1	What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
CO -2	What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
CO -3	How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?
CO -4	Review existing evidence on the review topic to inform programme design and policy making undertaken by the Dfid, other agencies and researchers.
CO -5	Understand critical evidence gaps to guide the development.
III-Sem	Course:Audit 1 and 2: Stress Management By Yoga
CO -1	Develop the knowledge about the Eight parts of yoga
CO -2	Develop healthy mind in a healthy body thus improving social health also
CO -3	Student will able to Improve efficiency
III-Sem	Course:Audit 1 and 2: Personality Development Through Life Enlightenment Skills
CO -1	Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life
CO -2	The person who has studied Geeta will lead the nation and mankind to peace and prosperity
CO -3	Study of Neetishatakam will help in developing versatile personality of students




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