

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PG-VLSI DESIGN

Program Outcomes (PO) / Course Outcome (CO) for all programs offered by the Institution

PROGRAMME OUTCOMES (POs):

On successful completion of the programme,

PO1	Graduates will be able to apply the knowledge of computing, mathematics, science and electronic engineering for designing VLSI circuits.
PO2	Graduates will have an ability to identify, formulate, investigate and solve the issues related to the design of VLSI and embedded systems.
PO3	Graduates will have an ability to design and conduct experiments, perform analysis and interpret the problems of VLSI design and embedded systems.
PO4	Graduates will be able to demonstrate the design of an embedded system, component or process as per needs and specifications.
PO5	Graduates will demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks.
PO6	Graduates will have the skills to use modern engineering tools, softwares and equipments to analyze problems.
PO7	Graduates will demonstrate knowledge of professional and ethical responsibilities.
PO8	Graduate will be able to communicate effectively in both verbal and written form.
PO9	Graduate will show the understanding of the impact of engineering solutions on the society and also will be aware of contemporary issues.
PO10	Graduate will develop confidence in self education and ability for lifelong learning.

Year / Sem: I / I

Course Code: C101

Course: Applied Mathematics for Electronics Engineers

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C101.1	Analyze	Concepts of fuzzy sets, knowledge representation using fuzzy rules, fuzzy logic, fuzzy prepositions and fuzzy quantifiers and applications of fuzzy logic. Apply various methods in matrix theory to solve system of linear
C101.2	Analyze	Computation of probability and moments, standard distributions of discrete and continuous equations
C101.3	Understand and Apply	random variables and functions of a random variable. Conceptualize the principle of optimality and sub-optimization, formulation and computational
C101.4	Understand, Apply and Evaluate	procedure of dynamic programming Exposing the basic characteristic features of a queuing system and acquire skills in analyzing
C101.5	Understand, Apply and Evaluate	queuing models. Using discrete time Markov chains to model computer systems

Year / Sem: I / I

Course Code: C102

Course: Advanced Digital System Design

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C102.1	Analyze	Analyze and design sequential digital circuits
C102.2	Apply	Design and use programming tools for implementing digital circuits of industry standards
C102.3	Understand	Identify the requirements and specifications of the system required for a given application
C102.4	Apply	Design and used programming tools for using programmable devices.
C102.5	Understand, Apply	Discuss about system design using very log

Year / Sem: I / I

Course Code: C103

Course: CMOS Digital VLSI Design

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C103.1	Understand	Carry out transistor level design of the most important building blocks used in digital CMOS VLSI circuits
C103.1	Understand,	Discuss design methodology of arithmetic building block
C103.1	Analyze	Analyze tradeoffs of the various circuit choices for each of the building block.
C103.1	Understand,	Discuss about arithmetic building blocks and memory architecture
C103.1	Understand,	Understand and apply interconnect and clocking strategy

Year / Sem: I / I

Course Code: C104

Course: DSP Integrated Circuits

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C104.1	Understand	Knowledge about the Digital Signal Processing concepts and its algorithms
C104.2	Understand	Knowledge about finite word length effects in digital filters•
C104.3	Understand	Knowledge about the Concept behind multi rate systems is understood
C104.4	Understand and Apply	To get familiar with the DSP processor architectures and how to perform synthesis of processing elements
C104.5	Understand	Discuss about arithmetic unit and processing elements

Year / Sem: I / I

Course Code: C105

Course: CAD for VLSI Circuits

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C105.1	Understand	Outline floor planning and routing
C105.2	Understand	Explain Simulation and Logic Synthesis
C105.3	Applying	Discuss the hardware models for high level synthesis
C105.4	Understand	Explain simulation and logic synthesis
C105.5	Understand	Explain High Level Synthesis

Year / Sem: I / I

Course Code: C106

Course: Analog IC Design

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C106.1	Applying	To design MOS single stage, multistage amplifiers and OPAMP for desired frequencies
C106.2	Analyze	Analyze Stability, frequency response, and Noise in MOS amplifiers
C106.3	Applying	Construct the Frequency Response Of Single Stage And Two Stage Amplifiers.
C106.4	Understand	Explain the Current Mirrors And Reference Circuits
C106.5	Applying	To design the operational amplifier circuits.

Year / Sem: I / I

Course Code: C107

Course: VLSI Design Laboratory I

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C107.1	Applying	Students will be able to characterize and model the circuit behaviours
C107.2	Analyze	student will be able to map it onto FPGA platform and carry out a series of validations design starting from design entry to hardware testing
C107.3	Applying	students will be able to design and carry out time domain simulations of simple analog building blocks
C107.4	Understand	student will be able to design and carry out frequency domain simulations of simple analog building blocks
C107.5	Applying	To study the pole zero behaviors of feedback based circuits and compute the input/output impedances.

Year / Sem: I / II

Course Code: C108

Course: Testing of VLSI Circuits

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C108.1	Creating	Design for testability
C108.2	Creating	Discuss test algorithms
C108.3	Understanding	Explain fault diagnosis
C108.4	Applying	Model the Testing knowledge skills get improved
C108.5	Creating	Solve the practical engineering problems pertaining to the field of VLSI designs.

Year / Sem: I / II

Course Code: C109

Course: VLSI Signal Processing

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy	DESCRIPTION
C109.1	Applying	Apply modification of the existing or new DSP architectures suitable for VLSI.
C109.2	Creating	Design pipeline-based architectures in the design.
C109.3	Understanding	Explain the metallization techniques to create three dimensional devices structures and devices.
C109.4	Creating	Design architecture for DSP algorithms
C109.5	Creating	Optimize design in terms of area, speed and power.

Year / Sem: I / II

Course Code: C110

Course: Low Power VLSI Design

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy	DESCRIPTION
C110.1	Understanding	Know the basics and advanced techniques in low power design which is a hot topic in today's market where the power plays major role.
C110.2	Remembering	List The reduction in power dissipation by an IC earns a lot including reduction in size, cost and etc.
C110.3	Understanding	Understand the concept of low power design and physics of power
C110.4	Creating	Develop logical level and circuit level power optimization techniques.
C110.5	Applying	Apply advance techniques and special techniques for reducing power consumption in memories.

Year / Sem: I / II

Course Code: C111

Course: Device Modeling - I

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C111.1	Creating	To design and model MOSFET and BJT devices to desired
C111.2	Creating	Completed one of the important prerequisites for professionals in the area of VLSI design
C111.3	Evaluating	Able to carry out transistor level hand calculation-based design of the most important building blocks used in digital CMOS VLSI circuits.
C111.4	understanding	Understanding of the design methodology and tradeoffs of the various circuit choices for each of all the blocks discussed.
C111.5	Analyzing	Real time application development.

Year / Sem: I / II

Course Code: C112

Course: Signal Integrity for High Speed Design

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C112.1	Analyzing	Ability to identify sources affecting the speed of digital circuits.
C112.2	Analyzing	Able to improve the signal transmission characteristics.
C112.3	Understanding	Knowledge of signal conditioning techniques and the necessary guide lines in a Mixed signal IC environment.
C112.4	Evaluating	Able to apply the suitable algorithm according to the given optimization problem.
C112.5	Analyzing	Ability to modify the algorithms to refine the complexity parameters.

Year / Sem: I / II

Course Code: C113

Course: Embedded System Design

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C113.1	Understanding	Explain different protocols
C113.2	Creating	Discuss state machine and design process models
C113.3	Remembering	List the Outline embedded software development tools and RTOS
C113.4	Analyzing	Able to select and design suitable embedded systems for real world applications.
C113.5	Understanding	Understanding of the fundamental Computational Intelligence models

Year / Sem: I / II

Course Code: C114

Course: VLSI Design Laboratory II

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C114.1	Understanding	The student would have hands on experience in the carrying out a complete VLSI based experiments using / CADENCE/ TANNER/
C114.2	Understanding	Have knowledge about digital system design
C114.3	Analyzing	Have analysis knowledge of various parameters
C114.4	Creating	Design and implement the embedded systems
C114.5	Creating	Have knowledge of layout level design entries

Year / Sem: I / II

Course Code: C115

Course: Term Paper Writing and Seminar

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C115.1	Understanding	Read and write the research article and publish a technical paper.
C115.2	Remembering	Prediction and Estimation concepts are well understood
C115.3	Understanding	Gather basic knowledge
C115.4	Understanding	Understanding of the fundamental Concepts
C115.5	Understanding	To demonstrate practical competence in these areas.

Year / Sem: II / III

Course Code: C201

Course: Analog to Digital Interfaces

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C201.1	Creating	Design Analog to Digital and Digital to Analog data converters based on data precision requirements
C201.2	Analyzing	Able to analyze and model the behavior analog interfaces and systems
C201.3	Understanding	Understand the principles of analog and digital interface
C201.4	Understanding	Know and understand the optimal solution to the filtering problem
C201.5	Evaluating	Ability to solve linear and nonlinear filtering problem

Year / Sem: II / III

Course Code: C202

Course: Digital Image Processing

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C202.1	Creating	To design and model MOSFET and BJT devices to desired
C202.2	Creating	Discuss image enhancement techniques
C202.3	Understanding	Explain color image processing
C202.4	Understanding	Compare image compression schemes
C202.5	Creating	Able to design and implement image enhancement schemes.

Year / Sem: II / III

Course Code: C203

Course: Hardware – Software Co-Design

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C203.1	Evaluating	To evaluate prototyping and emulation techniques
C203.2	Understanding	To compare hardware / software co-synthesis.
C203.3	Applying	To formulate the design specification and validate its functionality by simulation
C203.4	Creating	Able to design and implement image enhancement schemes.
C203.5	Creating	Able to design and implement compression schemes.

Year / Sem: II / III

Course Code: C204

Course: Project Work Phase-I

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C204.1	Applying	Identify a topic in advanced areas of Electronics and communication Engineering
C204.2	Analyzing	Examine literature to identify gaps and define objectives & scope of the work
C204.3	Create	Plan and implement innovative ideas for social benefit
C204.4	Applying	Develop a prototypes/models, experimental set-up and software systems necessary to meet the objectives
C204.5	Analyzing	Analyze and discuss the results to draw valid conclusions and Prepare a report as per recommended format and defend the work

Year / Sem: II / III

Course Code: C205

Course: Project Work Phase-II

On completion of this course the Students will be able to

S.NO.	Blooms' Taxonomy Level	DESCRIPTION
C205.1	Apply	The fundamental knowledge of Electrical and Electronics Engineering in developing novel products/solutions and thereby contributing to society
C205.2	Create	Capable of designing and developing system prototypes independently by utilizing latest software's and equipment's
C205.3	Knowledge	Intellectual capability and innovative thinking of the students are ignited
C205.4	Understand	Identify technical issues and solve them effectively in a systematic manner
C205.5	Create	Develop professionalism, build self-confidence and practice ethical