

**COURSE OUTCOMES (COS)****Course Outcomes: C211- M-III Probability and Statistics Year: II-I Sem A.Y: 2022-23**

C211.1	To determine Probability, Random variables, distributions and its application
C211.2	Apply the knowledge of some standard discrete probability distributions and moments.
C211.3	Calculate parameters of standard continuous probability distributions.
C211.4	Find the parameters and concepts of correlation, regression and obtain the knowledge of sampling theory.
C211.5	Analyze and check the validity of statement using testing of hypothesis of various parameters and goodness of fit.

Course Outcomes: C212 – English for Technical Communication Year: II-I Sem A.Y: 2022-23

C212.1	Apply technical communication skills effectively
C212.2	Adapt different types of official correspondence
C212.3	Construct report writing using various techniques
C212.4	Develop adequate skills of manual writing
C212.5	Interpret the information transfer from verbal to non-verbal data and vice-versa.

Course Outcomes: C213 Electronics Devices Year: II-I Sem A.Y: 2022-23

C213.1	Understanding of the characteristic behavior of various electronic devices such as Diodes, etc.
C213.2	Design rectifier circuits with filters Calculate ripple factor, efficiency and percentage regulation of rectifier circuits.
C213.3	Compare and Contrast the characteristics of BJT in various configurations.
C213.4	Distinguish the basics and working principles of FET & MOSFET
C213.5	To acquire knowledge on special purpose devices

Course Outcomes: C214– Signals and Systems Year: II-I Sem A.Y: 2022-23

C214.1	Understand mathematical description and representation of continuous and discrete time signals and systems.
C214.2	Derive Fourier series for continuous time signals and can find Fourier transform for different signals.
C214.3	Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system
C214.4	Classify systems based on their properties and determine the response of LTI system using convolution.
C214.5	Apply the Laplace transform and Z- transform for analyze of continuous-time and discrete-time signals and systems.

Course Outcomes: C215 – Network Theory Year: II-I Sem A.Y: 2022-23

C215.1	Understand the Basics of two port networks with its equivalence & Interconnection of two port networks.
C215.2	Analyse the Symmetrical & Asymmetrical networks by calculating its image and iterative impedances.
C215.3	Study & Design of various filters such as constant - k, m- derived and composite filter.
C215.4	Study & Analyse of various attenuators networks and equalizers.
C215.5	Synthesize the RL & RC networks in Foster and Cauer forms.

Course Outcomes: C216 – Advanced Communication Skills Lab Year: II-I Sem A.Y: 2022-23

C216.1	Acquire vocabulary and use it contextually
C216.2	Listen and speak effectively
C216.3	Develop proficiency in academic reading and writing
C216.4	Developing interview skills by conducting activities on Group Discussion in order to enhance the job prospects.
C216.5	Communicate confidently in formal and informal contexts

Course outcomes: C217 – Electronic Devices Lab**Year: II-I Sem****A.Y: 2022-23**

C217.1	Demonstrate the V-I characteristics of the P-N junction diode and determine forward bias voltage.
C217.2	Draw the characteristics of BJT in different configurations (CB, CE, CC) and identify various regions of operation from the graph.
C217.3	Build the circuit of BJT and FET Common emitter amplifier and determine its various parameters.
C217.4	Construct the BJT amplifier using various biasing techniques and compare using bias stability.
C217.5	Get familiarize with the PSPICE, build any four experiment and simulate.

Course outcomes: C218 – Basic Simulation Lab**Year: II-I Sem****A.Y: 2022-23**

C218.1	Understand the generation of different signals and performing various operations on them.
C218.2	Perform convolution and correlation operations on different signals and sequences.
C218.3	Verification of Linearity and Time Invariance Properties of a given Continuous/Discrete System.
C218.4	Analyse the spectrum and converting various time domain signals in to frequency domain using different techniques.
C218.5	Generation of Gaussian noise and studying the noise effects for different random processes.

Course outcomes: C219 – Python Programming Lab -1**Year: II-I Sem****A.Y: 2022-23**

C219.1	Learn to write test and debug simple python programs.
C219.2	Implement programs with conditionals and loops
C219.3	Develop Python programs step wise by defining functions and calling them.
C219.4	Use Python Lists, Dictionaries, tuples and Regular expressions in Python.
C219.5	Learn to read and write from/to files in Python



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Course outcomes: C311 – Digital Signal Processing Year: III-I Sem A.Y: 2022-23

C311.1	Understand the LTI system characteristics and Multirate signal processing.
C311.2	Understand the inter-relationship between DFT and various transforms.
C311.3	Design of a digital IIR filter for a given specifications using different techniques.
C311.4	Design of a digital FIR filter for a given specifications using different techniques.
C311.5	Understand the significance of various filter structures and effects of round off errors

Course outcomes: C312 – Microprocessor and Microcontroller Year: III-I Sem A.Y: 2022-23

C312.1	Visualization of architecture of 8086 microprocessor and recognize different types of addressing modes.
C312.2	Write assembly language programming using 8086 microprocessor instruction set.
C312.3	Familiarizations of different interface peripherals to 8086 microprocessors.
C312.4	Comprehend the architecture of 8051 architecture and capable of assembly/C language programming using 8051 microcontrollers.
C312.5	Handshaking of different peripherals interfaces to 8051 microcontrollers.

Course outcomes: C313 – Analog Communication Year: III-I Sem A.Y: 2022-23

C313.1	Understand analog communication system
C313.2	Compare and analyze analog modulation techniques
C313.3	Calculate noise performance of analog modulation techniques
C313.4	Design AM and FM receivers
C313.5	Differentiate between pulse modulation techniques & continuous modulation techniques

Course outcomes: C314 – Automatic Control Systems Year: III-I Sem A.Y: 2022-23

C314.1	Classify the control systems and analyse the system transfer function using different techniques such as block diagram & signal flow graph.
C314.2	Examine the stability of the system using time domain techniques such as R-H and Root locus techniques
C314.3	Analyze the compensation techniques and frequency domain specifications by using bode plot, nyquist plot in order to determine the stability of a system.
C314.4	Understand the digital control system and analyse it in discrete time domain.
C314.5	Analyze a control system using state space representation & determining the controllability and observability of systems.

Course outcomes: C315 – Antennas and Propagation Year: III-I Sem A.Y: 2022-23

C315.1	Understand the different characteristics of an antenna and determine radiation field patterns of it.
C315.2	Analyse radiation field characteristics of $\lambda/2$ dipole antenna, $\lambda/4$ monopole antenna, and different antenna arrays and demonstrate the characteristics of end fire, broad side and phased array antennas
C315.3	Demonstrate the working principle of different antennas and their applications.
C315.4	Demonstrate the working principle, design and applications of various horn and reflector antennas.
C315.5	Illustrate the various methods of radio wave propagation and explain different propagation parameters/terms such as virtual height, critical frequency, maximum usable frequency (MUF), skip distance.

Course outcomes: C316 – Industrial Administration and Financial Management Year: III-I Sem**A.Y: 2022-23**

C316.1	Understand Different phases of Product Life cycles, Manufacturing Systems,
C316.2	Understanding Plant Layout Optimization Problems
C316.3	Evaluate the Fundamental Concepts of Quality Control, Process Control, Material Control and appreciate the importance of MRP-1 & MRP-II
C316.4	Know the different terminology used in Financial Management
C316.5	Understand the different techniques of Capital Budgeting and Costs.

Course outcomes: C317 – Microprocessor and Microcontroller Lab Year: III-I Sem A.Y: 2022-23

C317.1	Handling of MASM tool for 8086 microprocessor programming
C317.2	Write assembly language programming using 8086 microprocessor instruction set.
C317.3	Familiarizations of different interface peripherals to 8086 microprocessors.
C317.4	Capable of assembly/C language programming using 8051 microcontrollers.
C317.5	Handshaking of different peripherals interfaces to 8051 microcontrollers.

Course outcomes: C318 – System & Signal Processing Lab Year III-I Sem A.Y: 2022-23

C318.1	Illustrate various signal processing algorithms.
C318.2	Analyze FIR Filter with specific magnitude and phase requirements.
C318.3	Analyze IIR Filter with specific magnitude and phase requirements.
C318.4	Illustrate the basics of Multirate signal processing
C318.5	Analyze digital filters on DSP processors.

Course outcomes: C319 - Mini Project Year: III-I Sem A.Y: 2022-23

C319.1	Acquired knowledge within the chosen area of technology for project development.
C319.2	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
C319.3	Reproduce, improve and refine technical aspects for engineering projects.
C319.4	Work as an individual or in a team in development of technical projects.
C319.5	Communicate and report effectively project related activities and findings



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Course Name: C411 Embedded System

Year: IV-I Sem A.Y: 2022-23

C411.1	Illustrate the fundamentals of the embedded system design.
C411.2	Enumerate the instruction set of ARM Processor by studying the architecture of ARM core.
C411.3	Demonstrate the knowledge about serial, parallel bus communication protocols and internet enabled systems-network protocols.
C411.4	Interpret steps and issues in the embedded system development process and different techniques for downloading embedded firmware into hardware
C411.5	Familiarize with the different IDEs for firmware development for different family of processors/controllers and learn about different tools and techniques for embedded hardware debugging.

Course Name: C412 VLSI Design

Year: IV-I Sem A.Y: 2022-23

C412.1	Analyze modes of operation of MOS transistor and its basic electrical properties.
C412.2	Draw the stick diagrams and layouts for any MOS transistors circuits and calculate the parasitic R&C.
C412.3	Analyze the operation of various arithmetic circuits for Subsystem Design.
C412.4	Design sequential logic circuits using CMOS transistors and need for CMOS testing.
C412.5	Illustrate the basic concepts of Analog VLSI Design required as a professional engineer.

Course Name: C413 Microwave Techniques

Year: IV-I Sem A.Y: 2022-23

C413.1	Analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical microwave transmission line problems
C413.2	Distinguish between the different types of waveguide and ferrite components, explain their functioning and select proper components for engineering applications.
C413.3	Realize the need for solid state microwave sources, understand the concepts of TEDs, RWH Theory and explain the salient features of Gunn Diodes and ATT Devices.
C413.4	Understand the principle and operation of M type tubes and their applications.
C413.5	Understand the properties of Scattering Matrix, formulate the S-Matrix for various microwave junctions, and understand the utility of S-parameters in microwave component design.

Course Name: C414 Industrial Administration and Financial Management

Year: IV-I Sem A.Y: 2022-23

C414.1	Understand Different phases of Product Life cycles, Manufacturing Systems,
C414.2	Understanding Plant Layout Optimization Problems
C414.3	Evaluate the Fundamental Concepts of Quality Control, Process Control, Material Control and appreciate the importance of MRP-1 & MRP-II
C414.4	Know the different terminology used in Financial Management
C414.5	Understand the different techniques of Capital Budgeting and Costs.

Course Name: C415 Mobile and Cellular Communication

Year: IV-I Sem A.Y: 2022-23

C415.1	Demonstrate basic concepts and operation of Basic Cellular System.
C415.2	Understand the concept and implementation of frequency reuse and Handoff techniques and to analyze interference and capacity enhancement
C415.3	Illustrate and understand the methods of electromagnetic wave propagation in cellular communication. The evaluation of the electromagnetic energy reaching the mobile unit.
C415.4	Analyse various multiple access protocols based on their merits and demerits and to explain features, authentication, operational details of GSM and CDMA mobile cellular systems along with data frame structure details.
C415.5	Understand the development and limitation of the preliminary and advanced generation of mobile systems and the present trends in Cellular communications and the future communication requirements.

Course Name: C416 Road Safety Engineering**Year: IV-I Sem A.Y: 2022-23**

C41.61	Compose accident investigation reports and database.
C41.62	Apply design principles for roadway geometrics improvement with various types of traffic safety appurtenances/tools.
C416.3	Outline the Road Signs and Traffic Signals by considering the factors affecting signal design and pedestrian's safety.
C416.4	Distinguish on different Traffic Management Techniques by using latest tools and techniques used for Road safety and traffic management.
C416.5	Manage traffic including incident management.

Course Name: C417 Entrepreneurship**Year: IV-I Sem A.Y: 2022-23**

C417.1	Illustrate the Indian Industrial Environment, Entrepreneurship and Economic growth, Small- and Large-Scale Industries, Types and forms of enterprises.
C417.2	Identify the characteristics of entrepreneurs, Emergence of first-generation entrepreneurs, Conception and evaluation of ideas and their sources.
C417.3	Practice the principles of project formulation, Analysis of market demand, Financial and profitability analysis and Technical analysis.
C417.4	Enumerate the concept of Intellectual Property Rights and Patents
C417.5	Comprehend the different aspects of Start-Ups and action plan for start-ups by Govt. of India.

Course Name: C418 Microwave Lab**Year: IV-I Sem A.Y: 2022-23**

C418.1	Study and Verify the characteristics of Reflex Klystron, Gunn diode and directional coupler.
C418.2	Understand the measurement of VSWR for different loads.
C418.3	Analyze the characteristics of the waveguide parameters and its measurement techniques.
C418.4	Understand the Measurement of Scattering Parameters of different microwave components.
C418.5	Understand the measurement of microwave frequency, attenuation and radiation pattern.

Course Name: C419 Electronic Design and Automation Lab**Year: IV-I Sem A.Y: 2022-23**

C419.1	Familiarize with the usage of IDE tools and program using various on chip like LCD, Temperature sensor, Buzzer, Stepper Motor by interfacing them to ARM Processor.
C419.2	Design the digital logic circuits in various modelling styles using Verilog HDL.
C419.3	Familiarize with VLSI CAD tools like Mentor Graphics /Cadence.
C419.4	Implement basic gates at transistor level.
C419.5	Implement the digital circuits at transistor level.

Course Name: C4110 Project Phase 1**Year: IV-I Sem A.Y: 2022-23**

C419.1	The student gains knowledge on the basic concepts of electrical engineering and learn the implementation.
C419.2	The student understands the design and analysis of particular problems in project.
C419.3	The students learn MATLAB programming and implementing the Simulink.
C419.4	The student will be able to develop the hardware.
C419.5	The student will learn the complete process of a project – designing, programming, module development.

Course Name: C4111 Summer Internship**Year: IV-I Sem A.Y: 2022-23**

C419.1	Construct the company profile by compiling the brief history, management structure, products / services offered, key achievements and market performance for his / her organization of internship.
C419.2	Determine the challenges and future potential for his / her internship organization in particular and the sector in general.
C419.3	Test the theoretical learning in practical situations by accomplishing the tasks assigned during the internship period.
C419.4	Analyze the functioning of internship organization and recommend changes for improvement in processes
C419.5	Construct the company profile by compiling the brief history, management structure, products / services offered, key achievements and market performance for his / her organization of internship.