Course Outcomes

Course Name: Numerical Methods & Complex Variables (C211)

Upon completing this course, the student will be able to:

C211.1: Apply the concepts of periodic function in terms of sine and cosine.

C211.2: Apply the concepts for finding the root of a given polynomial and transcendental equations.

C211.3: Formulate and solve problems and estimate the value for the given data using interpolation

C211.4: Apply concept of numerical solutions for a given first order ODE's

C211.5: Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems

C211.6: Express Taylor's and Laurent's series expansions in complex function

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO 5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C211.1	3	3	3	-	-	-	-	-	-	-	-	-	1	-	-
C211.2	3	3	3	-	-	-	-	-	-	-	-	-	1	-	-
C211.3	3	3	3	-	-	-	-	-	-	-	-	-	1	-	-
C211.4	3	3	3	-	-	-	-	-	-	-	-	-	1	-	-
C211.5	3	3	3	-	-	-	-	-	-	-	-	-	1	-	-
C211.6	3	3	3	-	-	-	-	-	-	-	-	-	1	-	-
C211	3	3	3	-	-	-	-	-	-	-	-	-	1	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Analog Circuits (C212)

Upon completing this course, the student will be able to:

C212.1: Design amplifier bias networks for BJT and FET with various biasing techniques.

C212.2: Design and analyze single-stage small-signal amplifiers using BJT and FET to meet specified gain, and input/output impedance constraints.

C212.3: Design multistage amplifiers and describe the concepts of High Frequency Analysis of BJT.

C212.4: Interpret the Concepts of negative feedback to improve the stability of amplifiers and apply positive feedback to design oscillators.

C212.5: Design various types of oscillators (RC, LC, and crystal) and evaluate their stability, and amplitude control.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C212.1	3	2	3	2	-	-	-	-	-	-	-	1	3	-	-
C212.2	3	2	3	2	-	-	-	-	-	-	-	1	2	-	-
C212.3	3	2	3	2	-	-	-	-	-	-	-	1	2	-	-
C212.4	3	3	3	2	-	-	-	-	-	-	-	1	-	1	-
C212.5	3	2	3	2	-	-	-	-	-	-	-	1	3	-	-
C212	3	2.2	3	2	-	-	-	-	-	-	-	1	2.5	1	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Network Analysis & Synthesis (C213)

Upon completing this course, the student will be able to:

C213.1: Gain the knowledge on network topologies with electrical components.

C213.2: Analyze the steady state and transient response of RLC circuits.

C213.3: Describe the characteristics of two port network parameters.

C213.4: Analyze the Design aspect of various filters and attenuators.

C213.5: Synthesize the various types of Network functions by different methods.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C213.1	3	2	1			-	1	-	-	-	-	1	1	-	-
C213.2	2	3	2	-	-	-	1	-	-	-	-	1	1	-	-
C213.3	3	2	1	-	-	-	1	-	-	-	-	1	1	-	-
C213.4	2	3	3	-	-	-	1	-	-	-	-	1	1	-	-
C213.5	3	2	3	-	-	-	1	-	-	-	-	1	1	-	-
C213	2.6	2.4	2	-	-	-	1	-	-	-	-	1	1	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Digital Logic Design (C214)

Upon completing this course, the student will be able to:

C214.1: Understand numerical representations, Boolean algebra, and logic gate realization techniques.

C214.2: Apply Boolean algebra and K-map methods to minimize and design combinational circuits.

C214.3: Analyze and design sequential circuits such as flip-flops, registers, and counters.

C214.4: Characterize and compare different logic families (TTL, CMOS, etc.) and their interfacing.

C214.5: Design and analyze Finite State Machines (FSM), both synchronous and asynchronous, and their application in digital systems.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C214.1	3	2	3	1	2	1	-	-	-	-	-	2	2	3	-
C214.2	3	2	2	1	2	1	-	-	-	-	-	2	2	3	-
C214.3	2	3	3	2	2	1	-	-	-	-	-	1	1	3	-
C214.4	3	2	1	1	1	-	-	-	-	-	-	-	-	2	-
C214.5	3	3	3	2	3	2	-	-	-	-	-	3	3	3	-
C214	2.8	2.4	2.4	1.4	2.0	1.2	-	-	-	-	-	2.0	2.0	2.8	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Signals & Systems (C215)

Upon completing this course, the student will be able to:

C215.1: Differentiate various signal functions.

C215.2: Represent any arbitrary signal in time and frequency domain.

C215.3: Describe the characteristics of linear time invariant systems.

C215.4: Relate the signals with different transform techniques.

C215.5: Explain sampling and correlation between two signals.

C215.6: Implement the Filter Characteristics, Auto-correlation, Cross-Correlation and its Power Density Spectrum.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C215.1	3	2	-	2	-	-	-	-	-	-	-	1	3	-	-
C215.2	3	2	2	-	-	-	-	-	-	-	-	-	3	-	-
C215.3	3	2	-	2	-	-	-	-	-	-	-	-	3	-	-
C215.4	3	2	2	2	-	-	-	-	-	-	-	2	3	-	-
C215.5	3	2	2	2	-	-	-	-	-	-	-	2	3	-	-
C215.6	3	2	2	-	-	-	-	-	-	-	-	2	3	-	-
C215	3	2	2	2	-	-	-	-	-	-	-	1.7	3	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Analog Circuits Lab (C216)

Upon completing this course, the student will be able to:

C216.1: Design transistor amplifiers by selecting the appropriate Q-point and analyze their characteristics.

C216.2: Evaluate the effects of multistage amplification on frequency response through experimentation.

C216.3: Investigate the role of feedback in amplifiers and oscillators for performance improvement.

C216.4: Construct and test oscillator circuits like RC phase shift and Colpitts oscillators for given specifications.

C216.5: Demonstrate the practical implementation of various amplifier configurations, including CE, CB, CC, and Cascode amplifiers.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C216.1	3	-	2	-	3	-	-	3	2	-	-	2	3	2	-
C216.2	3	-	2	-	3	-	-	3	2	-	-	2	3	2	-
C216.3	3	-	2	-	3	-	-	3	2	-	-	2	3	3	-
C216.4	2	2	2	-	3	-	-	2	2	-	-	3	3	3	-
C216.5	2	2	2	-	3	-	-	2	2	-	-	3	3	3	-
C216	2.6	2	2	-	3	-	-	2.6	2	-	-	2.4	3	2.6	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Digital Logic Design Lab (C217)

Upon completing this course, the student will be able to:

C217.1**:** Demonstrate understanding of number systems and Boolean Algebra concepts in the context of digital circuit implementation.

C217.2**:** Use the principles of Boolean Algebra to minimize and implement combinational logic circuits, evaluating their performance efficiency.

C217.3**:** Design and analyze sequential circuits such as flip-flops, counters, and state machines for specific functional requirements.

C217.4**:** Compare logic families using their AC and DC parameters to identify the most effective digital design implementations.

C217.5**:** Design and construct practical digital systems using basic gates, multiplexers, decoders, and flip-flops while adhering to given specifications.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C217.1	3	3	2	-	-	1	-	-	1	-	-	2	2	1	-
C217.2	3	3	3	2	-	1	-	-	1	-	-	2	2	1	-
C217.3	3	2	3	2	2	1	-	-	1	-	-	2	2	1	-
C217.4	3	2	2	2	-	1	-	-	1	-	-	1	2	1	-
C217.5	3	3	3	3	3	1	-	-	1	-	-	1	2	1	-
C217	3	2.6	2.6	2.2	2.5	1	-	-	1	-	-	1.6	2	1	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Basic Simulation Lab (C218)

Upon completing this course, the student will be able to:

C218.1: Test the generation and operations of various matrices, Signals and Sequences in MATLAB.

C218.2: Implement the convolution and correlation of signals and sequences.

C218.3: Judge the Sampling Theorem, Linearity and Time Invariance Properties of a given Signals/ Systems.

C218.4: Examine and Characterize Continuous and Discrete Time Systems both in Time and Frequency domain.

C218.5: Generate different Random Signals and capable to analyze their Characteristics.

C218.6: Use the Concepts of Deterministic and Random Signals for Noise removal Applications and on other Real Time Signals.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C218.1	3	3	2	-	3	-	-	-	2	1	-	1	1	2	-
C218.2	3	3	2	2	3	-	-	-	2	1	-	1	1	2	-
C218.3	3	3	2	2	3	-	-	-	2	1	-	1	1	2	-
C218.4	3	3	2	2	3	-	-	-	2	1	-	1	1	2	-
C218.5	3	3	3	2	3	-	-	-	2	1	-	1	-	3	-
C218.6	3	3	3	-	3	-	-	-	2	1	-	1	-	3	-
C218	3	3	2.3	2	3	-	-	-	2	1	-	1	1	2.3	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Constitution of India (C219)

Upon completing this course, the student will be able to:

C219.1: Explain the basic features of Constitution of India.

C219.2: Explain about salient features of the Constitution of India.

C219.3: Identify fundamental duties and federal structure of Constitution of India.

C219.4: Recognize the emergency provisions in Constitution of India.

C219.5: Explain about fundamental rights under constitution of India.

CO- PO& PSO Mapping

PO / CO	PO1	PO 2	PO3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C219.1	-	-	-	-	-	3	-	3	-	-	-	-	-	-	1
C219.2	-	-	-	-	-	3	-	3	-	-	-	-	-	-	1
C219.3	-	-	-	-	-	3	-	2	-	-	-	-	-	-	1
C219.4	-	-	-	-	-	3	-	3	-	-	-	-	-	-	1
C219.5	-	-	-	-	-	3	-	3	-	-	-	-	-	-	1
C219	-	-	-	-	-	3	-	2.8	-	-	-	-	-	-	1

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Design Thinking (C2110)

Upon completing this course, the student will be able to:

C2110.1: Appreciate various design process procedure

C2110.2: Generate and develop design ideas through different technique.

C2110.3: Identify the significance of reverse Engineering to Understand Products.

C2110.4: Draw technical drawing for design ideas.

C2110.5: Design thinking workshop and Teaching and Learning.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C2110.1	2	2	3	-	-	-	-	-	-	-	-	-	2	2	-
C2110.2	1	3	2	-	-	-	-	-	-	-	-	-	1	3	-
C2110.3	1	2	2	3	-	-	-	-	-	-	-	-	2	2	-
C2110.4	-	-	2	1	-	-	-	1	2	2	-	-	3	3	2
C2110.5	2	2	3	2	2	-	-	-	-	-	3	-	2	2	-
C2110	1.3	2.25	2.4	2	2	-	-	1	2	2	3	-	2	2.4	2

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Probability Theory & Stochastic Process (C221)

Upon completing this course, the student will be able to:

C221.1: Attain the knowledge of Probability theory and random variables

C221.2: Explain the Vector Random variables and joint distribution function

C221.3: Understand the response of linear time Invariant system for a Random Processes.

C221.4: Analyze the random variable and random process, its properties.

C221.5: Determine the Spectral and temporal characteristics of Random Signals.

C221.6: Analyze the concepts of Noise in Communication systems.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C221.1	3	-	-	2	1	-	-	-	-	2	-	-	-	3	-
C221.2	-	2	3	-	-	1	-	-	-	3	-	3	-	2	-
C221.3	3	-	-	2	1	-	-	-	-	-	2	-	-	3	-
C221.4	2	3	-	1	-	-	-	-	-	-	-	-	-	2	-
C221.5	3	-	-	2	1	-	-	-	-	-	-	2	-	3	-
C221.6	2	3	-	1	-	-	-	-	-	-	3	-	-	3	-
C221	2.6	2.6	3	1.6	1	1	-	-	-	2.5	2.5	2.5	-	2.6	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Electromagnetic Fields and Transmission Lines (C222)

Upon completing this course, the student will be able to:

C222.1: Acquire the knowledge of Basic Laws, Concept sand proofs related to Electrostatic Fields.

C222.2: Acquire the knowledge of Basic Laws, Concept sand proofs related to Magneto static Fields.

C222.3: Distinguish between the static and time-varying fields; establish the corresponding sets of Maxwell's Equations and Boundary Conditions.

C222.4: Examine the Wave Equations for good conductors, good dielectrics and evaluate the UPW Characteristics for several practical media of interest.

C222.5: Analyze the Design aspect of transmission line parameters and configurations.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C222.1	3	3	2	1	-	-	-	-	-	-	-	1	2	-	-
C222.2	3	3	2	1	-	-	-	-	-	-	-	1	2	-	-
C222.3	3	3	3	2	-	-	-	-	-	-	-	-	2	-	-
C222.4	3	3	2	2	-	-	-	-	-	-	-	-	2	-	-
C222.5	3	3	3	2	-	-	-	-	-	-	-	-	2	-	-
C222	3	3	2.4	1.6	-	-	-	-	-	-	-	1	2	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Analog and Digital Communications (C223)

Upon completing this course, the student will be able to:

C223.1: State the Modulation and need of Modulation and Design of various continuous wave and angle modulation and demodulation techniques.

C223.2: Identify the effect of noise present in continuous wave and angle modulation techniques and compare AM & FM.

C223.3: Classify and Compare AM, FM Transmitters and Receivers. [Understand & Analyse]

C223.4: Design the various Pulse Modulation Techniques.

C223.5: Explain the concepts of Digital Modulation Techniques and Baseband transmission**.**

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C223.1	2	2	3	1	-	3	-	-	-	-	-	1	2	-	-
C223.2	3	3	3	2	-	3	-	-	-	-	-	1	1	-	-
C223.3	2	3	2	2	-	3	-	-	-	-	-	1	2	2	-
C223.4	2	3	3	1	-	2	-	-	-	-	-	-	3	-	-
C223.5	3	2	2	-	-	3	-	-	-	-	-	-	2	-	-
C223	2.4	2.4	2.8	1.5	-	2.8	-	-	-	-	-	1	2	2	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Linear & Digital IC Applications (C224)

Upon completing this course, the student will be able to:

C224.1: Understand the characteristics, parameters, and applications of operational amplifiers and linear integrated circuits.

C224.2: Apply operational amplifiers, IC555, and IC565 in designing filters, waveform generators, and phase-locked loop applications.

C224.3: Analyze the working and design of various Analog-to-Digital and Digital-to-Analog converters.

C224.4: Evaluate the performance and select appropriate combinational logic ICs for digital circuit design.

C224.5: Design and integrate sequential logic ICs and memories for system-level applications.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C224.1	3	3	2	1	-	-	-	-	-	-	-	-	3	-	-
C224.2	3	3	3	1	-	-	-	-	-	-	-	-	3	-	-
C224.3	3	3	3	1	-	-	-	-	-	-	-	-	2	-	-
C224.4	3	3	2	1	-	-	-	-	-	-	-	-	2	3	-
C224.5	3	3	3	2	-	-	-	-	-	-	-	-	3	3	-
C224	3	3	2.6	1.2	-	-	-	-	-	-	-	-	2.6	3	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Electronic Circuit Analysis (C225)

Upon completing this course, the student will be able to:

C225.1: Implement Large signal Power Amplifiers and Assess their efficiency and performance

C225.2: Test Single Tuned and Double Tuned Amplifiers and Interpret the effects of Staggered and Synchronous Tuning on Frequency Response.

C225.3: Design transistor based Multivibrators and Schmitt Trigger suitable for various practical applications.

C225.4: Develop Time base generator circuits such as miller and Bootstrap configurations with enhanced linearity.

C225.5: Construct and test synchronization frequency division and sampling gate circuits for use in signal processing and communication.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C225.1	3	2	3	-	-	-	-	-	-	-	-	2	3	-	-
C225.2	3	3	3	-	-	-	-	-	-	-	-	2	3	-	-
C225.3	3	2	3	-	-	-	-	-	-	-	-	2	3	-	-
C225.4	3	2	3	-	-	-	-	-	-	-	-	2	3	-	-
C225.5	3	3	3	-	-	-	-	-	-	-	-	2	3	-	-
C225	3	2.4	3	-	-	-	-	-	-	-	-	2	3	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Analog &Digital Communications Lab (C226)

Upon completing this course, the student will be able to:

C226.1: Design and implement various Analog modulation and demodulation Techniques and observe the time and frequency domain characteristics.

C226.2: Design and implement various Pulse modulation and demodulation Techniques and observe the time and frequency domain characteristics.

C226.3: Use different types of Sampling with various Sampling rates and duty Cycles.

C226.4: Design and implement various Digital modulation and demodulation Techniques and observe the waveforms of these modulated Signals practically.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C226.1	1	2	3	1	3	-	-	-	-	-	-	1	2	3	-
C226.2	1	2	3	1	3	-	-	-	-	-	-	1	2	3	-
C226.3	1	3	2	1	3	-	-	-	-	-	-	1	1	3	-
C226.4	1	3	3	1	3	-	-	-	-	-	-	1	2	3	-
C226	1	2.5	2.7	1	3	-	-	-	-	-	-	1	1.75	3	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Linear & Digital IC Applications Lab (C227)

Upon completing this course, the student will be able to:

C227.1: Analyze and design operational amplifier circuits like amplifiers, filters, and waveform generators using IC 741.

C227.2: Design and implement multivibrator circuits using IC 555 for specified outputs and applications.

C227.3: Design ADCs and DACs for converting between analog and digital signals with high accuracy.

C227.4: Design and verify the functionality of voltage regulators for specific applications using IC 723, IC 7805/7809/7912.

C227.5: Implement and verify combinational circuits like encoders, decoders, and multiplexers using digital ICs.

C227.6: Design and test sequential circuits like counters, shift registers, and RAM using digital ICs.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C227.1	3	2	3	3	3	-	-	-	-	2	-	1	3	3	-
C227.2	3	2	3	3	3	-	-	-	-	2	-	1	3	2	-
C227.3	3	2	3	3	3	-	-	-	-	2	-	1	3	3	-
C227.4	3	2	3	3	3	-	-	-	-	2	-	1	3	2	-
C227.5	3	2	3	3	3	-	-	-	-	2	-	1	3	3	-
C227.6	3	2	3	3	3	-	-	-	-	2	-	1	3	3	-
C227	3	2	3	3	3	-	-	-	-	2	-	1	3	2.66	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Electronic Circuit Analysis lab (C228)

Upon completing this course, the student will be able to:

C22.1: Test and distinguish different power amplifier designs and analyze their efficiency.

C228.2: Develop tuned amplifier circuits and operate them under laboratory conditions. Interpret the measured data to evaluate the Q-factor of the circuit.

C228.3: Construct and operate various multivibrator and sweep circuits.

C228.4: Assemble and operate sampling gate and Schmitt trigger circuits.

C228.5: Implement and operate experiments for hardware verification and circuit simulation.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C228.1	1	2	3	2	3	-	-	-	-	-	-	1	2	2	-
C228.2	1	2	3	2	3	-	-	-	-	-	-	1	2	2	-
C228.3	1	2	3	2	3	-	-	-	-	-	-	1	2	2	-
C228.4	1	2	3	2	3	-	-	-	-	-	-	1	2	2	-
C228.5	1	2	3	2	3	-	-	-	-	-	-	1	2	2	-
C228	1	2	3	2	3	-	-	-	-	-	-	1	2	2	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Real Time Projects/Field Based Project (C229)

Upon completing this course, the student will be able to:

C229.1: Identify and define real-time engineering problems related to ECE and propose feasible solutions.

C229.2: Apply theoretical knowledge of electronic circuits, communication systems, and embedded concepts to design and develop a working model.

C229.3: Use modern tools and software for circuit simulation, design, and testing

C229.4: Demonstrate teamwork, ethical responsibility, and effective communication in project execution.

C229.5: Prepare technical documentation and present project outcomes effectively.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO4	PO 5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C229.1	3	3	2	2	2	1	-	-	2	2	1	2	3	-	-
C229.2	3	3	3	2	3	-	-	1	2	2	2	2	3	-	-
C229.3	2	2	3	3	3	-	-	-	1	2	2	3	3	3	-
C229.4	1	1	2	-	2	1	-	2	3	3	2	2	-	-	3
C229.5	1	1	2	-	2	-	-	1	2	3	2	3	-	-	3
C229	2	2	2.4	2.33	2.4	1	-	1.33	2	2.4	1.8	2.4	3	3	3

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Gender Sensitization lab (C2210)

Upon completing this course, the student will be able to:

C2210.1: Develop students' sensibility with regard to issues of gender in contemporary India.

C2210.2: Provide a critical perspective on the socialization of men and women.

C2210.3: Explain the students to information about some key biological aspects of genders.

C2210.4: Interpret the students to debates on the politics and economics of work.

C2210.5: Help students reflect critically on gender violence.

C2210.6: Expose students to more egalitarian interactions between men and women.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO1 2	PSO1	PSO 2	PSO 3
C2210.1	-	-	-	-	-	2	-	2	-	-	-	-	-	-	1
C2210.2	-	-	-	-	-	3	-	3	3	-	-	-	-	-	1
C2210.3	-	-	-	-	-	2	-	2	-	-	-	-	-	-	1
C2210.4	-	-	-	-	-	-	-	3	2	2	-	-	-	-	1
C2210.5	-	-	-	-	-	-	-	2	2	3	-	-	-	-	1
C2210.6	-	-	-	-	-	2	-	2	2	2	-	-	-	-	1
C2210	-	-	-	-	-	2.25	-	2.33	2.25	2.33	-	-	-	-	1

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Microcontrollers (C311)

Upon completing this course, the student will be able to:

C311.1: Describe the architecture, organization and assembly language program of 8086 processors.

C311.2: Explain the architecture, organization and assembly language program of 8051 controller.

C311.3: Implement the interfacing of peripherals to 8051 and demonstrate serial and bus communication interface.

C311.4: Analyze the internal architecture and features of the ARM processor.

C311.5: Describe the internal architecture and features of CORTEX ARM and OMAP processor.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C311.1	3	2	-	-	-	-	-	-	-	-	-	1	2	-	-
C311.2	3	2	3	2	-	-	-	-	-	-	-	1	2	-	-
C311.3	3	2	3	2	-	-	-	-	-	-	-	1	3	-	-
C311.4	3	3	-	2	-	-	-	-	-	-	-	1	3	-	-
C311.5	3	2	-	-	-	-	-	-	-	-	-	2	3	-	-
C311	3	2.2	3	2	-	-	-	-	-	-	-	1.2	2.6	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Course Name: IoT Architectures & Protocols (C312)

Upon completing this course, the student will be able to:

C312.1: Explain the evolution of IoT, its characteristics, enabling technologies, and applications in real-world scenarios.

C312.2: Analyze and compare different IoT architectures and their components, including M2M communication.

C312.3: Identify and evaluate various IoT data link and network layer protocols to address communication challenges.

C312.4: Apply transport and session layer protocols like MQTT, CoAP, and AMQP in IoT applications.

C312.5: Examine service layer protocols and IoT security mechanisms to ensure scalability and data integrity.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C312.1	3	2	3	2	2	2	1	-	-	-	1	1	3	2	1
C312.2	3	2	3	2	2	2	1	-	-	-	1	1	3	3	2
C312.3	3	2	3	2	2	2	1	-	-	-	1	1	3	3	3
C312.4	3	2	3	2	2	2	1	-	-	-	2	2	3	3	3
C312.5	3	2	3	2	2	2	1	-	-	-	2	2	3	3	3
C312	3.0	2.0	3.0	2.0	2.0	2.0	1.0	-	-	-	1.8	1.8	3.0	2.8	2.4

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Control Systems (C313)

Upon completing this course, the student will be able to:

C313.1: Determine the mathematical modelling of physical systems and evaluate their transfer function of using block diagram and /or signal-flow graph techniques.

C313.2: Analyze the time-domain response of first and second order systems for various standard test signals and investigate their stability using time-domain techniques.

C313.3: Examine the relationship between time-domain and frequency domain response of second order system and analyze the systems using frequency-domain techniques.

C313.4: Design and analyze various types of controllers and compensators for first and second order systems using time-domain and frequency domain techniques.

C313.5: Acquire knowledge of optimal & non-linear control basic concepts, design and analyze various types of state-space model continuous and discrete data systems.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C313.1	3	3	3	3	-	-	-	-	1	1	1	2	1	-	-
C313.2	3	3	3	3	-	-	-	-	1	1	1	2	1	-	-
C313.3	3	3	3	2	-	-	-	-	1	1	1	2	1	-	-
C313.4	3	3	3	2	-	-	-	-	1	1	1	2	1	-	-
C313.5	3	3	3	3	-	-	-	-	1	1	1	2	1	-	-
C313.6	3	3	3	3	-	-	-	-	1	1	1	2	1	-	-
C313	3	3	3	2.66	-	-	-	-	1	1	1	2	1	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Business Economics and Financial Analysis (C314)

Upon completing this course, the student will be able to:

C314.1: Understand the various Forms of Business and the impact of economic variables on the Business

C314.2: Define demand and law of demand and demand forecasting

C314.3: Explain cost and its short run, long run cost functions

C314.4: Define market, explain types of markets, pricing methods.

C314.5: Define accounting, types of accounts and implement final accounts.

C314.6: Define Ratio, explain types of ratios.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C314.1	-	-	-	-	-	2	-	-	3	2	3	1	-	-	1
C314.2	-	-	-	-	-	2	-	-	3	2	3	1	-	-	1
C314.3	-	-	-	-	-	2	-	-	3	2	3	1	-	-	1
C314.4	-	-	-	-	-	2	-	-	3	2	3	1	-	-	1
C314.5	-	-	-	-	-	2	-	-	3	2	3	1	-	-	1
C314.6	-	-	-	-	-	2	-	-	3	2	3	1	-	-	1
C314	-	-	-	-	-	2	-	-	3	2	3	1	-	-	1

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Computer Organization & Operating Systems (C315)

Upon completing this course, the student will be able to:

C315.1: Explain the basic structure, operation and data representation of a digital computer.

C315.2: Design control unit using micro programming (micro operations) and explain the memory system.

C315.3: Compare different ways of communicating with I/O devices and standard I/O interfaces.

C315.4: Explain the Operating system functions, types, system calls and Memory management techniques.

C315.5: Explain the deadlock detection and avoidance techniques and file system implementation and its interface.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C315.1	3	2	1	1	2	-	-	-	-	-	-	1	1	-	-
C315.2	3	2	3	1	2	-	-	-	-	-	-	1	1	-	-
C315.3	3	2	1	1	2	-	-	-	-	-	-	1	1	-	-
C315.4	3	2	1	1	2	-	-	-	-	-	-	1	1	-	-
C315.5	3	2	1	1	2	-	-	-	-	-	-	1	1	-	-
C315	3	2	1.4	1	2	-	-	-	-	-	-	1	1	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Embedded System Design (C315)

Upon completing this course, the student will be able to:

C315.1: Describe the basics of an embedded system

C315.2: Explain the selection procedure of processors in the embedded domain.

C315.3: Design the procedure for developing embedded firmware.

C315.4: Analyze the role of Real-Time Operating Systems in Embedded Systems.

C315.5: Evaluate the correlation between task synchronization and latency issues.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C315.1	3	2	-	-	-	-	-	-	-	-	-	2	-	2	-
C315.2	3	3	-	-	2	-	-	-	-	-	-	2	-	2	-
C315.3	2	3	3	2	3	-	-	-	-	-	-	2	3	-	-
C315.4	2	3	2	3	3	-	-	-	-	-	-	2	-	2	-
C315.5	2	3	2	3	3	-	-	-	-	-	-	2	-	2	-
C315	2.4	2.8	2.33	2.66	2.75	-	-	-	-	-	-	2	3	2	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Electronic Measurements & Instrumentation (C315)

Upon completing this course, the student will be able to:

C315.1: Measure electrical parameters with different meters and understand the basic definition of measuring parameters.

C315.2: Use various types of signal generators, signal analyzers for generating and analyzing various real-time signals.

C315.3: Operate an Oscilloscope to measure various signals.

C315.4: Measure various physical parameters by appropriately selecting the transducers.

C315.5: Demonstrate the functioning, specification, application and parameters of signal analysing instruments & Bridge circuits.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C315.1	3	2	3	2	-	-	-	-	-	-	-	1	2	-	-
C315.2	3	2	3	2	-	-	-	-	-	-	-	1	2	-	-
C315.3	3	2	2	-	-	-	-	-	-	-	-	1	2	-	-
C315.4	3	2	3	2	-	-	-	-	-	-	-	1	2	-	-
C315.5	3	2	3	2	-	-	-	-	-	-	-	1	2	-	-
C315	3	2	2.8	2	-	-	-	-	-	-	-	1	2	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Microcontrollers Lab (C316)

Upon completing this course, the student will be able to:

C316.1: Write assembly language programs and implement them on 8086.

C316.2: Write assembly language programs and implement them on 8051.

C316.3: Interface the I/O devices with 8051 microcontrollers.

C316.4: Perform and evaluate experiments on Cortex-M3 development boards using GNU tool-chain.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C316.1	3	3	3	2	3	-	-	-	-	-	-	1	2	3	-
C316.2	3	3	3	2	3	-	-	-	-	-	-	1	2	3	-
C316.3	3	3	3	3	3	-	-	-	-	-	-	1	2	3	-
C316.4	3	3	3	3	3	-	-	-	-	-	-	1	2	3	-
C316	3	3	3	2.5	3	-	-	-	-	-	-	1	2	3	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: IoT Architectures & protocols Lab (C317)

Upon completing this course, the student will be able to:

C317.1: Utilize different sensors like room temperature, DHT, and humidity sensors to gather environmental data.

C317.2: Interface sensors with microcontrollers for data transmission to cloud platforms.

C317.3: Capture images and process them on Arduino/NodeMCU/Raspberry Pi for IoT applications.

C317.4: Implement communication protocols like I2C, UART, and SPI in embedded systems.

C317.5: Design and develop IoT-based systems such as home automation and obstacle detection.

C317.6: Analyze and upload real-time sensor data to the cloud using REST API and MQTT.

CO- PO & PSO Mapping

PO / CO	PO 1	PO2	PO 3	PO 4	PO 5	PO6	PO 7	PO8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C317.1	3	2	3	3	3	1	1	-	-	-	-	1	3	3	-
C317.2	3	2	3	3	3	1	1	-	-	-	-	1	3	3	-
C317.3	3	2	3	3	3	1	1	-	-	-	-	1	3	3	-
C317.4	3	2	3	3	3	1	1	-	-	-	-	1	3	3	-
C317.5	3	3	3	3	3	2	2	-	2	2	-	2	3	3	-
C317.6	3	3	3	3	3	2	2	-	2	2	-	2	3	3	
C317	3	2.33	3	3	3	1.33	1.33	-	2	2	-	1.33	3	3	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Advanced English Communication Skills Lab (C318)

Upon completing this course, the student will be able to:

C318.1: Demonstrate effective listening and reading comprehension skills by understanding facts, meanings, and contexts from various sources.

C318.2: Develop writing proficiency through vocabulary enrichment, structured composition, and different forms of professional writing.

C318.3: Enhance presentation skills through effective use of verbal and non-verbal communication, appropriate language, and confidence in delivery.

C318.4: Participate productively in group discussions by organizing ideas, maintaining relevance, and exhibiting appropriate behaviour and fluency.

C318.5: Exhibit confidence and professionalism during interviews by applying learned strategies, communication techniques, and presentation etiquette.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C318.1	-	-	-	-	-	-	-	-	2	3	-	2	-	-	2
C318.2	-	-	-	-	-	-	-	-	-	3	-	2	-	-	1
C318.3	-	-	-	-	-	-	-	-	-	3	-	2	-	-	2
C318.4	-	-	-	-	-	-	-	-	-	3	-	2	-	-	2
C318.5	-	-	-	-	-	-	-	-	-	3	-	2	-	-	2
C318	-	-	-	-	-	-	-	-	2	3	-	2	-	-	1.8

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Intellectual Property Rights (C319)

Upon completing this course, the student will be able to:

C319.1: Explain various forms of intellectual property right and different international organizations.

C319.2: Describe trademarks and can implement in trademark registration.

C321.3: Describe copyrights and can implement them in ownership rights.

C319.4: Judge the different types of patents and can use in ownership rights and transfer.

C319.5: Examine false advertising in the market and trade secret protection.

C319.6: Anticipate critical analysis arguments relating to the new development in intellectual property rights.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C319.1	2	-	-	-	-	1	-	-	-	-	-	2	-	-	1
C319.2	-	-	-	-	-	-	-	2	-	-	-	2	-	-	1
C319.3	1	-	-	-	-	-	-	-	2	-	-	2	-	-	1
C319.4	2	-	-	-	-	-	-	-	2	-	-	-	-	-	1
C319.5	-	2	-	-	-	-	-	2	-	-	-	-	-	-	1
C319.6	2	2	-	-	-	-	-	-	-	-	-	-	-	-	1
C319	1.75	2	-	-	-	1	-	2	2	-	-	2	-	-	1

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Antennas and Propagation (C321)

Upon completing this course, the student will be able to:

C321.1: Understand the concept of radiation, antenna definitions and significance of antenna parameters, to derive and analyze the radiation characteristics of thin wire dipole antennas and solve numerical problems.

C321.2: Analyze the characteristics and design relations of UHF, VHF and Microwave Antennas.

C321.3: Identify the antenna array requirements, to determine the characteristics of ULAs and estimate the patterns of BSA, EFA, and Binomial Arrays.

C321.4: Understand the concepts and set-up requirements for microwave measurements, and familiarize with the procedure to enable antenna measurements.

C321.5: Define and distinguish between different phenomenon of wave propagation (ground wave, space wave and sky wave), their frequency dependence, and estimate their characteristics, identifying their profiles and parameters involved.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C321.1	3	2	2	-	-	-	-	-	-	-	-	-	2	2	-
C321.2	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
C321.3	2	3	2	-	-	-	-	-	-	-	-	-	2	2	-
C321.4	2	2	2	-	2	-	-	-	-	-	-	-	-	3	-
C321.5	2	3	-	2	-	-	2	2	-	-	-	-	2	3	-
C321	2.4	2.4	2	2	2	-	2	2	-	-	-	-	2	2.5	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Digital Signal Processing (C322)

Upon completing this course, the student will be able to:

C322.1: Explain the LTI system characteristics and Multirate signal processing.

C322.2: Examine the inter relationship between DFT and various Transforms and use different FFT algorithms for DFT computations.

C322.3: Design IIR digital filters for given specifications.

C322.4: Design FIR digital filters for given specifications.

C322.5: Demonstrate the various digital filter structures and effects of round off errors.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C322.1	3	3	2	3	-	-	-	-	-	-	-	1	3	-	-
C322.2	3	3	2	2	2	-	-	-	-	-	-	1	2	2	-
C322.3	3	3	3	1	3	-	-	-	-	-	-	1	3	-	-
C322.4	3	3	3	1	3	-	-	-	-	-	-	1	3	-	-
C322.5	3	3	2	3	-	-	-	-	-	-	-	1	2	2	-
C322	3	3	2.4	2	2.66	-	-	-	-	-	-	1	2.6	2	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: CMOS VLSI Design (C323)

Upon completing this course, the student will be able to:

C323.1: Acquire qualitative knowledge about the fabrication process of integrated circuits using MOS transistors.

C323.2: Draw the layout of any logic circuit, which helps to understand and estimate the parasitic effects of any logic circuit.

C323.3: Design building blocks of data path sub systems, Array subsystems or memories.

C323.4: Design simple logic circuits using PLA, PAL, FPGA, and CPLD.

C323.5: Understand different types of faults that can occur in a system and learn the concept of testing and adding extra hardware to improve the testability of a system.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C323.1	3	3	2	2	2	-	1	-	-	-	-	1	3	-	-
C323.2	3	3	2	3	-	-	1	-	-	-	-	1	2	-	-
C323.3	3	2	3	-	3	1	1	-	-	-	-	1	3	-	-
C323.4	3	3	3	2	3	1	1	-	-	-	-	1	2	-	-
C323.5	3	3	3	2	3	1	1	-	-	-	-	1	3	-	-
C323	3	2.8	2.6	2.25	2.7	1	1	-	-	-	-	1	2.6	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Data Communications & Computer Networks (C324)

Upon completing this course, the student will be able to:

C324.1: Identify the categories and functions of various data communication networks.

C324.2: Design, implement, and evaluate various error detection and correction techniques.

C324.3: Demonstrate the mechanism of routing the data in the network layer.

C324.4: Examine the significance of various flow control and congestion control mechanisms for efficient data communication.

C324.5: Describe the functioning of various application layer protocols.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C324.1	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
C324.2	3	3	3	3	2	1	-	-	-	-	-	-	3	-	-
C324.3	2	2	3	2	1	1	-	-	-	-	-	-	2	-	-
C324.4	2	3	2	3	2	-	-	-	-	-	-	-	-	-	-
C324.5	2	1	2	2	-	-	-	-	-	-	-	-	3	-	-
C324	2.4	2.2	2.5	2.5	1.66	1	-	-	-	-	-	-	2.5	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Wireless Sensor Networks (C324)

Upon completing this course, the student will be able to:

C324.1: Compare various architectures of Wireless Sensor Networks.

C324.2: Identify Design issues and challenges in wireless sensor networks.

C324.3: Compare various data gathering and data dissemination methods.

C324.4: Design, Simulate and Compare the performance of various routing and MAC protocol.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C324.1	3	3	2	2	1	-	-	-	-	-	-	-	3	-	-
C324.2	3	3	2	2	1	-	-	-	-	-	-	-	3	-	-
C324.3	3	3	2	2	3	-	-	-	-	-	-	-	3	-	-
C324.4	3	3	2	2	3	-	-	-	-	-	-	-	3	-	-
C324	3	3	2	2	2	-	-	-	-	-	-	-	3	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: CMOS Analog IC Design (C324)

Upon completing this course, the student will be able to:

C324.1: Design basic building blocks of CMOS Analog ICs.

C324.2: Design of single and two stage operational amplifiers and voltage references.

C324.3: Identify the device dimensions of each MOSFETs involved.

C324.4: Design various amplifiers like differential, current and operational amplifiers.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C324.1	3	3	3	2	2	-	-	-	-	-	-	1	3	-	-
C324.2	3	3	3	2	2	-	-	-	-	-	-	1	3	-	-
C324.3	3	3	3	2	2	-	-	-	-	-	-	1	-	1	-
C324.4	3	3	3	2	2	-	-	-	-	-	-	1	3	-	-
C324	3	3	3	2	2	-	-	-	-	-	-	1	3	1	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Disaster Preparedness Planning & Management (C325)

Upon completing this course, the student will be able to:

C325.1: Explain disaster management basics and theory (cycle, phases, risk, crisis, emergency, disasters, resilience)

C325.2: Compare hazards, disasters and associated natural phenomena and their interrelationships, causes and their effects - developing humanitarian Assistance before and after disaster.

C325.3: Compare anthropogenic hazards, disasters and associated activities and their interrelationships of the subsystems - Green House Effect, Global warming, Causes and their effects and development of humanitarian assistance before and after disaster.

C325.4: Apply knowledge about existing global frameworks and existing agreements and role of community in successful Disaster Risk Reduction

C325.5: Evaluate by conducting DM study including data search, analysis and presentation of a disaster case study.

C325.6: Try to make Technological innovations in Disaster Risk Reduction: Advantages and problems.

CO- PO & PSO Mapping

PO / CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C325.1	1	2	-	-	2	-	-	-	-	-	-	-	-	-	1
C325.2	1	-	-	2	3	-	-	-	-	-	-	-	-	-	1
C325.3	1	2	2	-	-	-	-	-	-	-	-	2	-	-	1
C325.4	1	2	2	-	-	-	-	-	-	-	-	2	-	-	1
C325.5	2	-	2	-	-	-	-	-	-	-	-	-	-	-	1
C325.6	2	-	3	-	-	-	-	-	-	-	-	1	-	-	1
C325	1.33	2	2.25	2	2.5	-	-	-	-	-	-	1.66	-	-	1

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Digital Signal Processing Lab (C326)

Upon completing this course, the student will be able to:

C326.1: Develop an understanding of the characteristics of basic signals and waveforms, and demonstrate their generation to analyze their behaviour in practical scenarios**.**

C326.2: Investigate the presence of noise in signals and evaluate how it affects overall signal behaviour and performance in real-world applications.

C326.3: Perform spectral analysis on discrete-time signals to examine their frequency content and signal properties.

C326.4: Design and implement digital filters to process signals, achieving specific performance objectives and desired signal outcomes.

C326.5: Utilize appropriate sampling and reconstruction techniques to accurately convert signals between continuous and discrete forms while preserving their fidelity.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C326.1	2	-	-	2	3	-	-	-	-	-	-	2	2	-	-
C326.2	2	2	-	-	-	-	-	-	-	-	-	-	2	2	-
C326.3	2	2	-	2	3	-	-	-	-	-	-	3	2	2	-
C326.4	2	-	3	-	3	-	-	-	-	-	-	-	-	2	2
C326.5	2	2	-	-	3	-	-	-	-	-	-	3	-	2	2
C326	2	2	3	2	3	-	-	-	-	-	-	2.6	2	2	2

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: CMOS VLSI Lab (C327)

Upon completing this course, the student will be able to:

C327.1: Simulate basic logic gates (AND, OR, NOT, NAND, etc.) using HDL, and analyze the results.

C327.2: Design and implement combinational circuits (e.g., multiplexers, decoders, encoders) using HDL and evaluate their functionality.

C327.3: Design and perform layout of a CMOS inverter, and verify its functionality using physical design tools, including static timing analysis.

C327.4: Synthesize and optimize sequential circuits (e.g., flip-flops, counters, FSMs) using HDL, and evaluate their performance.

C327.5: Perform synthesis and layout design for both analog and digital CMOS circuits, including verification and performance analysis.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C327.1	2	3	2	2	3	-	-	-	2	-	-	2	3	3	-
C327.2	3	3	3	3	3	-	-	-	2	-	-	2	3	3	-
C327.3	3	3	3	2	3	-	-	-	2	-	-	-	3	3	-
C327.4	3	3	3	3	3	-	-	-	2	-	-	2	3	3	-
C327.5	3	3	3	3	3	-	-	-	2	-	-	2	3	3	-
C327	2.8	3	2.8	2.6	3	-	-	-	2	-	-	2	3	3	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Advanced Communications Lab (C328)

Upon completing this course, the student will be able to:

C328.1: Demonstrate the operation and characteristics of spectrum analyzers used in RF communication systems.

C328.2: Analyze and verify digital modulation schemes such as QAM and single-carrier modulated signals using MATLAB and hardware kits.

C328.3: Implement and evaluate adaptive beam forming algorithms (LMS and variable step-size) for smart antenna systems.

C328.4: Estimate signal parameters using ESPRIT and spatial smoothing techniques in coherent environments.

C328.5: Design and simulate wireless sensor network communication protocols using NS2 for data transmission and control.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C328.1	3	3	2	2	1	-	-	-	-	-	-	1	3	-	-
C328.2	3	3	3	2	1	-	-	-	-	-	-	1	3	2	-
C328.3	3	3	3	2	2	-	-	-	-	-	-	1	2	3	-
C328.4	3	3	3	2	2	-	-	-	-	-	-	1	2	3	-
C328.5	3	3	3	2	2	-	-	-	-	-	-	1	2	3	-
C328	3	3	2.8	2	1.6	-	-	-	-	-	-	1	2.4	2.75	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Industry Oriented Mini Project/Internship (C329)

Upon completing this course, the student will be able to:

C329.1: Identify and define an engineering problem relevant to the electronics and communication industry.

C329.2: Explain the theoretical concepts and technologies applicable to the selected project domain.

C329.3: Use appropriate engineering tools, hardware, and software to develop proposed project solutions.

C329 .4: Compare and interpret the performance of the developed prototype or simulation results.

C329.5: Evaluate the effectiveness, reliability, and feasibility of the project outcomes with respect to industry standards.

C329.6: Design and present a functional prototype or model demonstrating innovation and teamwork.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C329.1	3	3	2	2	2	-	-	1	1	1	-	2	2	-	-
C329.2	3	2	2	2	2	-	-	1	1	1	-	3	2	-	-
C329.3	3	3	3	2	3	-	-	-	2	2	2	2	3	-	-
C329.4	2	3	3	3	3	-	-	1	2	2	2	2	-	3	-
C329.5	2	3	3	3	3	1	1	2	2	2	2	2	-	3	-
C329.6	3	2	3	2	3	1	1	1	3	3	3	3	-	-	3
C329	2.66	2.66	2.66	2.33	2.66	1	1	1.2	1.83	1.83	2.25	2.33	2.33	3	3

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Environmental Science (C3210)

Upon completing this course, the student will be able to:

C3210.1: Students are able to get the information about the eco-system and also about its functions like food chain ecological pyramids.

C3210.2: Students are able to get the knowledge about the different types of resources like water, minerals and land and also about the effects of environment by the usage of these resources.

C3210.3: Students are able to gain the knowledge about the ecosystem diversity, its values and also about the importance endemic species.

C3210.4: Students are able to gain the knowledge about the different types of pollutions and their control methods, waste water treatment methods etc

C3210.5: Students are able to list out the environmental policies, EIA - environmental impact assessment.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C3210.1	-	-	-	-	-	1	2	-	-	-	-	-	-	1	-
C3210.2	-	1	-	-	-	1	2	-	-	-	-	1	-	1	-
C3210.3	-	-	-	-	-	1	2	-	-	-	-	1	-	1	-
C3210.4	-	1	-	-	-	2	2	-	-	-	-	-	-	1	-
C3210.5	-	-	-	-	-	2	3	-	-	-	-	1	-	1	-
C3210	-	1	-	-	-	1.4	2.2	-	-	-	-	1	-	1	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Microwave Engineering (C411)

Upon completing this course, the student will be able to:

C411.1: To analyse completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical microwave transmission line

C411.2: To distinguish between the different types of waveguide and ferrite components, explain their functioning and select proper components for Engineering Applications.

C411.3: To distinguish between the methods of power generation at microwave frequencies, derive the performance characteristics of 2-Cavity and Reflex Klystrons, Magnetrons, TWTs and estimate their efficiency levels, and solve related numerical problems

C411.4: To 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.

C411.5: To establish the properties of Scattering Matrix, formulate the S-Matrix for various microwave junctions, and understand the utility of S-parameters in microwave component design and establish the measurement procedure of various microwave parameters.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C411.1	3	-	1	2	1	-	-	-	-	-	-	-	3	-	-
C411.2	3	2	2	2	2	-	-	-	-	-	-	-	3	-	-
C411.3	3	-	2	2	3	-	-	-	-	-	-	2	3	-	-
C411.4	3	-	1	2	3	-	-	-	-	-	-	3	3	-	-
C411.5	3	-	2	2	1	-	-	-	-	-	-	2	3	-	-
C411	3	2	1.6	2	2	-	-	-	-	-	-	2.33	3	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Mobile Communications & Networks (C412)

Upon completing this course, the student will be able to:

C412.1: Understand the evolution of cellular mobile communication systems and identify the limitations of conventional systems.

C412.2: Analyze co-channel and non–co-channel interferences and evaluate diversity techniques to improve signal quality.

C412.3: Apply cell coverage concepts, frequency management, and channel assignment strategies for efficient mobile communication design.

C412.4: Examine different handoff strategies, causes of dropped calls, and evaluate performance parameters in mobile networks.

C412.5: Compare cellular and ad hoc wireless networks and explain the design goals and issues of MAC protocols for ad hoc systems.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C412.1	3	3	2	2	1	1	1	-	-	-	-	1	3	2	-
C412.2	3	3	2	2	1	1	1	-	-	-	-	1	3	2	-
C412.3	3	3	2	2	1	1	1	-	-	-	-	1	2	3	-
C412.4	3	3	2	2	1	1	1	-	-	-	-	1	2	3	-
C412.5	3	3	2	2	1	1	1	-	-	-	-	1	2	3	-
C412	3	3	2	2	1	1	1	-	-	-	-	1	2.4	2.6	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Machine Learning (C412)

Upon completing this course, the student will be able to:

C412.1: Explain the fundamental concepts of Neural Networks.

C412.2: Select appropriate learning networks for modelling real-world systems.

C412.3: Implement efficient algorithms for deep learning models.

C412.4: Use optimization strategies for large-scale neural network applications.

CO- PO & PSO Mapping

PO / CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C412.1	3	2	2	-	2	-	-	-	-	-	-	3	1	-	-
C412.2	3	3	2	2	3	-	-	-	-	-	-	3	-	2	-
C412.3	2	3	3	2	3	-	-	-	-	-	-	3	-	2	-
C412.4	3	3	3	2	3	-	-	-	-	-	-	3	-	2	-
C412	2.75	2.75	2.5	2	2.75	-	-	-	-	-	-	3	1	2	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Biomedical Instrumentation (C412)

Upon completing this course, the student will be able to:

C412.1: Discuss bio systems and medical systems from an engineering perspective.

C412.2: Identify the techniques to acquire record and primarily understand physiological activity of the human body through cell potential, ECG, EEG, BP and blood flow measurement and EMG.

C412.3: Explain the working of various medical instruments and critical care equipment.

C412.4: Know the imaging techniques including CT, PET, SPECT and MRI used in diagnosis of various medical conditions.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C412.1	3	2	2	2	-	-	-	-	-	-	-	-	2	-	-
C412.2	3	2	2	2	-	-	-	-	-	-	-	-	2	-	-
C412.3	3	3	2	2	-	-	-	-	-	-	-	-	2	-	-
C412.4	3	3	2	2	-	-	-	-	-	-	-	-	2	-	-
C412	3	2.5	2	2	-	-	-	-	-	-	-	-	2	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Digital Image Processing (C413)

Upon completing this course, the student will be able to:

C413.1: Explain the steps involved in digital image processing..

C413.2: Explore the fundamental relations between pixels and utility of 2-D transforms in image processer.

C413.3: Interpret the enhancement, segmentation and restoration processes on an image.

C413.4: Implement the various Morphological operations on an image.

C413.5: Explain the need of compression and evaluation of basic compression algorithms.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C413.1	3	1	2	2	-	-	-	-	-	-	-	-	2	-	-
C413.2	3	1	2	2	-	-	-	-	-	-	-	-	2	-	-
C413.3	3	3	2	2	2	-	-	-	-	-	-	-	2	-	-
C413.4	3	3	3	2	3	-	-	-	-	-	-	-	2	-	-
C413.5	3	3	2	2	3	-	-	-	-	-	-	-	2	-	-
C413	3	2.2	2	2	2.6	-	-	-	-	-	-	-	2	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Artificial Intelligence (C413)

Upon completing this course, the student will be able to:

C413.1: Explain the basics of AI theory and the concept of intelligent agents.

C413.2: Demonstrate the use of heuristic searches and explain knowledge-based and expert systems.

C413.3: Use AI techniques to solve real-world problems and develop intelligent systems.

C413.4: Select and justify appropriate AI techniques when implementing intelligent systems.

CO- PO & PSO Mapping

PO / CO	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C413.1	3	2	2	-	2	-	-	-	-	-	-	2	1	-	-
C413.2	3	3	2	2	3	-	-	-	-	-	-	2	-	1	-
C413.3	3	3	3	2	3	-	-	-	-	-	-	2	-	3	-
C413.4	3	3	3	2	3	-	-	-	-	-	-	2	-	3	-
C413	3	2.75	2.5	2	2.75	-	-	-	-	-	-	2	1	1.75	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Network Security & Cryptography (C413)

Upon completing this course, the student will be able to:

C413.1: Describe network security fundamental concepts and principles.

C413.2: Encrypt and decrypt messages using block ciphers and network security technology and protocols.

C413.3: Compare and contrast symmetric and asymmetric Key Cryptography systems.

C413.4: Differentiate key agreement algorithms to identify their weaknesses.

C413.5: Identify and assess different types of threats, malware, spyware, viruses, and vulnerabilities.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C413.1	3	1	2	1	1	-	-	-	-	-	-	-	1	-	-
C413.2	3	2	2	2	1	-	-	-	-	-	-	-	3	-	-
C413.3	3	3	2	2	1	-	-	-	-	-	-	-	2	-	-
C413.4	3	3	2	2	1	-	-	-	-	-	-	-	3	-	-
C413.5	3	3	2	2	1	-	-	-	-	-	-	-	1	-	-
C413	3	2.4	2	1.8	1	-	-	-	-	-	-	-	2	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Software Engineering (C414)

Upon completing this course, the student will be able to:

C414.1: Define the evolving role and changing nature of the software and also the generic view of process and process models.

C414.2: Explain about the software requirements, requirement engineering process and process models.

C414.3: Implement to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).

C414.4: Examine the appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.

C414.5: Investigate about the software metrics and RMMM, and also they will have awareness on the quality management of the software.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C414.1	3	2	1	2	3	-	-	2	2	2	2	3	-	2	-
C414.2	-	3	2	1	3	-	-	2	3	2	2	-	-	2	-
C414.3	-	2	3	2	2	2	-	-	2	2	2	1	-	2	-
C414.4	3	2	3	2	3	-	1	2	2	3	1	-	-	3	-
C414.5	3	3	2	3	3	-	-	2	3	3	2	1	-	2	-
C414	3	2.4	2.2	2	2.8	2	1	2	2.4	2.4	1.8	1.6	2	2.2	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Professional Practice, Law and Ethics (C415)

Upon completing this course, the student will be able to:

C415.1: Demonstrate an awareness of ethics, professionalism, and the importance of ethical behaviour in engineering practice.

C415.2: Understand and apply contractual principles, such as basic elements and breach remedies.

C415.3: Explore dispute resolution procedures such as arbitration and conciliation to resolve industrial and legal disputes.

C415.4: Analyze the fundamentals of arbitration agreements, the role of arbitral tribunals, and their effectiveness in dispute resolution.

C415.5: Recognize the significance of intellectual property rights and the laws controlling copyright, patents, and trademarks.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C415.1	-	-	-	-	-	-	-	3	-	-	-	-	-	-	3
C415.2	2	3	-	-	2	-	-	-	-	-	-	-	-	-	3
C415.3	-	3	2	-	-	-	-	-	2	-	-	2	-	-	-
C415.4	-	3	-	3	-	-	-	-	-	-	-	-	-	-	2
C415.5	-	-	-	-	3	-	-	-	-	-	-	2	-	-	2
C415	2	3	2	3	2.5	-	-	3	2	-	-	2	-	-	2.5

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Microwave and Optical Communications Lab (C416)

Upon completing this course, the student will be able to:

C416.1: Analyze the performance characteristics of microwave components such as reflex klystrons, Gunn diodes, and directional couplers for their performance evaluation.

C416.2: Measure and interpret microwave parameters such as attenuation, VSWR, impedance, and scattering parameters for waveguide components.

C416.3: Perform frequency and data rate measurements in microwave and optical communication systems.

C416.4: Investigate the characteristics of optical sources, such as LEDs and laser diodes, for their suitability in optical communication.

C416.5: Demonstrate the process of intensity modulation and loss measurements in optical fibre links.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C416.1	3	3	2	3	3	-	-	-	-	-	-	-	3	3	-
C416.2	3	2	3	3	3	-	-	-	-	-	-	-	3	3	-
C416.3	3	2	3	1	2	2	-	-	-	-	-	1	3	2	-
C416.4	3	3	2	3	3	-	-	-	-	-	-	1	2	3	-
C416.5	3	2	3	2	3	2	-	-	-	-	-	1	3	3	-
C416	3	2.4	2.6	2.4	2.8	2	-	-	-	-	-	1	2.8	2.8	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Project Stage-I (C417)

Upon completing this course, the student will be able to:

C417.1: Identify a research or industry-oriented problem relevant to the domain.

C417.2: Conduct literature review and summarize prior work to understand the current state-of-the-art.

C417.3: Formulate objectives and define the scope of the project clearly.

C417.4: Develop a feasible project plan including methodology, resources, and timeline.

C417.5: Analyze potential challenges and propose suitable strategies to mitigate risks.

C417.6: Present the problem statement, objectives, and proposed methodology effectively in oral and written form.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C417.1	3	3	2	2	2	-	-	1	2	2	-	3	-	1	-
C417.2	3	3	2	3	2	-	-	1	2	2	-	3	-	1	-
C417.3	2	3	3	2	2	-	-	1	2	2	2	3	-	1	-
C417.4	2	3	3	2	3	-	-	1	2	2	3	3	-	1	-
C417.5	2	3	3	3	2	-	-	1	2	2	2	3	-	1	-
C417.6	2	2	2	2	2	-	-	2	3	3	2	3	-	-	3
C417	2.33	2.83	2.5	2.33	2.16	-	-	1.16	2.16	2.16	2.25	3	-	1	3

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Radar Systems (C421)

Upon completing this course, the student will be able to:

C421.1: Derive the complete radar range equation.

C421.2: Explain the functioning of CW, FM-CW and MTI radars.

C421.3: Classify various Tracking methods.

C421.4: Derive the matched filter response characteristics for radar receivers.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C421.1	3	1	2	2	-	-	-	-	-	-	-	-	3	-	-
C421.2	3	1	2	2	-	-	-	-	-	-	-	-	3	-	-
C421.3	3	1	2	2	-	-	-	-	-	-	-	-	3	-	-
C421.4	3	1	2	2	-	-	-	-	-	-	-	-	2	-	-
C421	3	1	2	2	-	-	-	-	-	-	-	-	2.75	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: 5G and Beyond Communications (C421)

Upon completing this course, the student will be able to:

C421.1: Explain the basics of MIMO, including spatial multiplexing, spatial diversity, and beam forming, and analyze hybrid precoding and 5G system concepts.

C421.2: Understand the concepts of 5G, WISDOM, and D2D communication, and explain the architecture, processes, and interoperability of SMNAT.

C421.3: Examine the characteristics of mmWave propagation, including large-scale and small-scale channel effects, and analyze outdoor and indoor channel models.

C421.4: Defend the higher-layer design challenges for mmWave networks and analyze protocols, relaying, multimedia support, multiband operation, and standards (ECMA-387, IEEE 802.11ad).

C421.5: Examine the major challenges in future cyber security, spectrum-related security issues in CRNs, and emerging mobile technologies including HAPS, Human Bond Communications, and CONASENSE.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C421.1	3	2	2	2	-	-	-	-	-	-	-	2	1	-	-
C421.2	3	2	2	2	-	-	-	-	-	-	-	2	1	-	-
C421.3	3	3	2	3	-	-	-	-	-	-	-	2	-	2	-
C421.4	3	3	3	3	-	-	-	-	-	-	-	2	-	2	-
C421.5	3	3	2	3	-	-	-	-	-	-	-	2	-	2	-
C421	3	2.6	2.2	2.6	-	-	-	-	-	-	-	2	1	2	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Artificial Neural Networks (C421)

Upon completing this course, the student will be able to:

C421.1: Describe the similarity of Biological networks and Neural networks.

C421.2: Perform the training of neural networks using various learning rules.

C421.3: Explain the concepts of forward and backward propagations.

C421.4: Understand and Construct the Hopfield models.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C421.1	3	3	2	2	1	-	-	-	-	-	-	-	3	-	-
C421.2	3	3	2	2	1	-	-	-	-	-	-	-	3	-	-
C421.3	3	3	2	2	3	-	-	-	-	-	-	-	3	-	-
C421.4	3	3	2	2	3	-	-	-	-	-	-	-	3	-	-
C421	3	3	2	2	2	-	-	-	-	-	-	-	3	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Satellite Communications (C422)

Upon completing this course, the student will be able to:

C422.1: Understand basic concepts, frequency allocations for satellite communication, orbital mechanics, and launch vehicles.

C422.2: Analyze the satellite subsystems such as attitude control, power systems, and telemetry.

C422.3: Design satellite communication links for specified carrier-to-noise (C/N) ratios.

C422.4: Explore and compare various multiple access techniques for satellite communications and earth station technologies.

C422.5: Understand the concepts of LEO, GEO satellite systems, and satellite navigation principles like GPS.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C422.1	3	2	1	1	-	-	-	-	-	-	-	-	3	-	-
C422.2	3	2	2	2	-	1	-	-	-	-	-	-	3	-	-
C422.3	3	3	3	2	1	1	-	-	-	-	-	-	3	-	-
C422.4	3	3	3	2	2	-	-	-	-	-	-	-	2	-	-
C422.5	3	2	2	2	-	1	-	-	-	-	-	-	3		
C422	3	2.4	2.2	1.8	1.5	1	-	-	-	-	-	-	2.8	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Optical Communications (C422)

Upon completing this course, the student will be able to:

C422.1: Explain and analyze the constructional parameters of optical fibers.

C422.2: Design an optical communication system for specified requirements.

C422.3: Estimate losses in optical fibers due to attenuation, absorption, scattering, and bending.

C422.4: Compare various optical detectors and select suitable ones for different applications.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C422.1	3	2	2	2	-	-	-	-	-	-	-	1	2	-	-
C422.2	3	3	3	2	-	-	-	-	-	-	-	1	2	-	-
C422.3	3	3	2	3	-	-	-	-	-	-	-	1	2	-	-
C422.4	3	3	3	2	-	-	-	-	-	-	-	1	2	-	-
C422	3	2.75	2	2.25	-	-	-	-	-	-	-	1	2	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Multimedia Database Management Systems (C422)

Upon completing this course, the student will be able to:

C422.1: Explain the fundamentals of Database Management Systems, database design principles, and normalization concepts.

C422.2: Apply SQL commands to retrieve, manipulate, and manage data in relational databases.

C422.3: Analyze the concepts of transaction processing, concurrency control, and recovery mechanisms in database systems.

C422.4: Describe various database storage structures and illustrate access techniques used for efficient data retrieval.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C422.1	3	2	2	-	2	-	-	-	-	-	-	1	1	-	-
C422.2	3	3	2	2	3	-	-	-	-	-	-	1	-	1	-
C422.3	3	3	2	3	2	-	-	-	-	-	-	1	-	1	-
C422.4	3	2	2	2	3	-	-	-	-	-	-	1	1	-	-
C422	3	2.5	2	2.33	2.5	-	-	-	-	-	-	1	1	1	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Environmental Pollution and Control (C423)

Upon completing this course, the student will be able to:

C423.1: Explain the fundamentals of solid waste management and analyze the practices adopted in local areas to maintain urban health.

C423.2: Identify various air pollutants and describe the working of air pollution control devices along with national air quality and emission standards.

C423.3: Differentiate between various sewage and industrial waste water treatment techniques and select suitable methods for specific applications.

C423.4: Design and propose effective methods for environmental sanitation and develop management strategies to prevent epidemics in communities.

C423.5: Assess the importance of sustainable development principles while planning and executing environmental projects or industrial activities.

CO- PO & PSO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C423.1	3	3	2	2	-	-	-	-	-	-	-	-	-	-	2
C423.2	3	3	2	2	2	-	-	-	-	-	-	-	-	-	2
C423.3	3	3	3	2	2	-	-	-	-	-	-	-	-	-	2
C423.4	3	3	3	2	2	-	-	-	-	-	-	-	-	-	2
C423.5	3	3	3	3	2	-	-	-	-	-	-	-	-	-	2
C423	3	3	2.6	2.2	2	-	-	-	-	-	-	-	-	-	2

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Project Stage-II including Seminar (C424)

Upon completing this course, the student will be able to:

C424.1: Design and develop a functional prototype or software system based on the project plan.

C424.2: Implement algorithms, circuits, or modules and integrate them to realize the complete system.

C424.3: Test the system thoroughly, analyze results, and debug issues to ensure desired performance.

C424.4: Evaluate the performance, reliability, and efficiency of the system against project objectives.

C424.5: Document the design, implementation, testing, and results in a professional project report.

C424.6: Present and defend the project effectively through seminars and demonstrations.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C424.1	3	3	3	2	3	2	2	2	3	3	3	3	3	3	-
C424.2	3	3	3	2	3	2	2	2	3	2	3	3	3	-	-
C424.3	3	3	2	3	3	2	2	2	3	2	2	3	-	3	-
C424.4	3	3	3	3	3	2	2	2	3	3	3	3	-	3	-
C424.5	3	2	3	2	2	2	2	3	3	3	3	3	-	-	3
C424.6	2	2	3	2	2	2	2	3	3	3	3	3	-	-	3
C424	2.83	2.66	2.83	2.33	2.66	2	2	2.	3	2.66	2.83	3	3	3	3

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Matrices and Calculus (C111)

Upon completing this course, the student will be able to:

C111.1: Student will be able to represent linear system of equations in matrix form and find its solution

C111.2: Student will be able to finding the Eigen values and Eigen vectors.

C111.3: Student will be able to apply orthogonal transformations to a quadratic form.

C111.4: Verify Rolle's, Lagrange's and Cauchy's mean value theorems for several functions.

C111.5: Student will be able to estimate the maxima & minima of multivariable functions using partial derivatives method & Lagrange's multiplier methods.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO4	P O5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C111.1	2	2	-	3	-	-	-	-	-	-	-	-	1	-	-
C111.2	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
C111.3	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
C111.4	3	1	-	3	-	-	-	-	-	-	-	-	2	-	-
C111.5	3	3	-	2	-	-	-	-	-	-	-	-	1	-	-
C111	2.60	2.40	-	2.67	-	-	-	-	-	-	-	-	1.33	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Applied Physics (C112)

Upon completing this course, the student will be able to:

C112.1: Explain the laws of black body radiations and basic quantum mechanical principles and theories.

C112.2: Summarize the importance of semiconductors and their applications in latest technologies such as in solar cells. Describe the working and applications of various optoelectronic devices such as LED and SLD and photo detectors such as solar cells, PIN, APD.

C112.3: Describe various properties of dielectric materials and Apply the knowledge of piezo, ferro and pyro electricity. Describe and apply the concept of magnetic hysteresis and the importance Magnetic materials. Analyse and apply the applications of energy materials.

C112.4: Describe the synthesis methods for nanomaterials. Evaluate state-of-the-art characterization methods for nanomaterials.

C112.5: Explain the construction and working of lasers and Describe principle of propagation of light in optical fibers and losses associated.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	P O4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C112.1	2	2	2	-	-	-	-	-	-	-	-	-	1	-	-
C112.2	2	3	2	-	-	-	-	-	-	-	-	2	1	-	-
C112.3	2	3	2	-	-	-	-	-	-	-	-	3	1	-	-
C112.4	3	2	3	-	-	-	-	-	-	-	-	-	1	-	-
C112.5	3	2	2	-	-	-	-	-	-	-	-	2	1	-	-
C112	2.40	2.40	2.20	-	-	-	-	-	-	-	-	2.33	1.00	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: C Programming for Engineers (C113)

Upon completing this course, the student will be able to:

C113.1: To write algorithms and to draw flowcharts for solving problems and to convert the algorithms/flowcharts to C programs.

C113.2: To code and test a given logic in C programming language. To use arrays, pointers, strings and structures to write C programs.

C113.3: Pre-processor and Files: Text file and Binary File.

C113.4: To decompose a problem into functions and to develop modular reusable code.

C113.5: Searching and sorting problems.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	P O4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C113.1	3	2	-	-	-	-	-	-	-	-	-	-	-	1	-
C113.2	2	2	3	-	-	-	-	-	-	-	-	-	-	2	2
C113.3	3	2	2	-	-	-	-	-	-	-	-	-	-	3	2
C113.4	3	3	2	-	-	-	-	-	-	-	-	-	-	-	1
C113.5	3	2	3	-	-	-	-	-	-	-	-	-	-	1	-
C113	2.80	2.20	2.50	-	-	-	-	-	-	-	-	-	-	1.75	1.67

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Engineering Workshop (C114)

Upon completing this course, the student will be able to:

C114.1: Apply basic carpentry tools and techniques to measure, cut, assemble, and finish wood materials, demonstrating precision and craftsmanship.

C114.2: Analyze and apply fitting techniques to measure, cut, shape, and assemble metal components with precision, ensuring proper alignment and functionality.

C114.3: Demonstrate proficiency in various welding techniques (Arc) to fabricate and join metal parts, ensuring strong and clean welds with safety protocols.

C114.4: Create and develop patterns, models, and castings for metal components, applying casting techniques to produce quality parts from ferrous and non-ferrous metals.

C114.5: Install and configure electrical wiring systems, circuits, and appliances, ensuring compliance with electrical codes and safety standards.

C114.6: Use tin smithy tools to cut, bend, shape, and join tin sheets to create functional and decorative products, ensuring quality and durability.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO5	P O6	PO 7	PO 8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PS O3
C114.1	2	-	3	-	3	-	-	-	-	-	-	-	-	1	-
C114.2	2	-	3	-	3	-	-	-	3	-	-	-	-	1	-
C114.3	3	-	2	-	3	-	-	-	-	-	-	-	-	-	-
C114.4	3	-	3	-	2	-	-	-	3	-	-	-	-	2	-
C114.5	3	-	2	-	3	-	-	-	2	-	-	-	-	-	-
C114.6	3	-	3	-	2	-	-	-	3	-	-	-	-	2	-
C114	2.66	-	2.66	-	2.66	-	-	-	2.75	-	-	-	-	1.5	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: English for Skill Enhancement (C115)

Upon completing this course, the student will be able to:

C115.1: Developing the language proficiency of students in English with an emphasis on vocabulary, grammar and pronunciation.

C115.2: Understand the given texts and respond appropriately.

C115.3: Communicate and integrate confidently in various contexts and different cultures

C115.4: Acquire basic proficiency in English in describing, reading, listening comprehension, writing and speaking skills.

C115.5: Develop awareness in the students about the significance of silent reading, analyzing and comprehending.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO 11	PO 12	PS O1	PSO 2	PSO 3
C115.1	3	3	-	-	-	-	-	-	-	3	-	3	-	1	-
C115.2	2	2	-	-	-	-	-	-	-	2	-	2	-	1	-
C115.3	2	2	-	-	-	-	-	-	-	2	-	3	-	-	1
C115.4	3	3	-	-	-	-	-	-	-	3	-	3	-	-	1
C115.5	2	3	-	-	-	-	-	-	-	2	-	2	-	1	-
C115	2.40	2.60	-	-	-	-	-	-	-	2.40	-	2.60	-	1.00	1.00

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Elements of Electronics and Communication Engineering (C116)

Upon completing this course, the student will be able to:

C116.1: Identify the different components used for electronics applications.

C116.2: Measure different parameters using various measuring instruments.

C116.3: Distinguish various signal used for analog and digital communications.

C116.4: Understand the significance of Electronics and communications.

C116.5: Identify various Digital and Analog ICs.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C116.1	2	2-	-	-	3	-	-	-	-	-	-	-	1	-	-
C116.2	3	2	-	-	2	-	-	-	-	-	-	1	1	-	-
C116.3	2	1	-	-	2	-	-	-	-	-	-	1	1	-	-
C116.4	2	2	-	-	2	-	-	-	-	-	-	2	1	-	-
C116.5	2	1	-	-	2	-	-	-	-	-	-	-	1	-	-
C116	2.20	1.60	-	-	2.20	-	-	-	-	-	-	1.40	1	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Applied Physics Lab (C117)

Upon completing this course, the student will be able to:

C117.1: Describe principle of propagation of light in optical fibers.

C117.2: Describe the working and applications of various optoelectronic devices such as LED.

C117.3: Identify the material whether it is n-type or p-type by Hall Experiment.

C117.4: Inter modulus of elasticity of torsion pendulum and Young's modulus of elasticity of a disc.

C117.5: Explain the construction and working of lasers.

C117.6: Summarize the importance of semiconductors and their applications in latest technologies such as in solar cells. [Understand]

C117.7: Illustrate the characteristics of PN diode, Zener diode.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C117.1	2	-	3	-	3	-	-	-		-	-	-	-	1	-
C117.2	3	3	-	-	-	-	-	-	3	-	-	-	-	-	-
C117.3	3	2	-	-	-	-	-	-	3	-	-	-	-	3	-
C117.4	-	3	3	-	-	-	-	-		-	-	-	-	3	-
C117.5	3	--	1	-	3	-	-	-	3	-	-	-	-	-	-
C117.6	2	2		-	-	-	-	-		-	-	-	-	2	-
C117.7	3	-	3	-	2	-	-	-		-	-	-	-	-	-
C117	2.66	2.5	2.5	-	2.66	-	-	-	3	-	-	-	-	2.25	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: C Programming for Engineers Lab (C118)

Upon completing this course, the student will be able to:

C118.1: To write algorithms and to draw flowcharts for solving problems.

C118.2: To convert the algorithms/flowcharts to C programs.

C118.3: To code and test a given logic in the C programming language.

C118.4: To decompose a problem into functions and to develop modular reusable code.

C118.5: To use arrays, pointers, strings and structures to write C programs.

C118.6: Searching and sorting problem.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C118.1	3	3	3	--	--	--	--	--	--		--	3	--	3	--
C118.2	3	--	3	--	--	--	--	--	--	2	--	--	--	-	3
C118.3	--	3	3	--	--	--	--	--	--	3	--	2	--	3	--
C118.4	3	1	2	--	--	--	--	--	--	2	--	--	--	-	3
C118.5	--	3	3	--	--	--	--	--	--	3	--	2	--	-	2
C118.6	2	--	--	--	--	--	--	--	--		--	3	--	3	--
C118	2.75	2.5	2.8	-	-	-	-	-	-	2.5	-	2.5	-	3	2.66

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: English Language and Communication Skills lab (C119)

Upon completing this course, the student will be able to:

C119.1: Understand the nuances of English Language through audio-visual experience and group activities.

C119.2: Speak with Clarity and Confidence which in turn enhances their employability skills.

C119.3: Neutralize their accent for intelligibility.

C119.4: Students would be able to enhance non verbal communication along with verbal communication.

C119.5: Enhance the listening skills with correspondence to comprehension.

C119.6: Speak with clarity and confidence which in turn enhances their employability skills

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C119.1	3	-	-	-	-	-	-	-	-	3	-	3	-	-	1
C119.2	2	-	-	-	-	-	-	-	-	3	-	2	-	-	1
C119.3	2	-	-	-	-	-	-	-	-	2	-	3	-	-	1
C119.4	-	-	-	-	-	-	-	-	-	3	-	2	-	-	1
C119.5	-	-	-	-	-	-	-	-	-	2	-	3	-	-	1
C119.6	-	-	-	-	-	-	-	-	-	2	-	3	-	-	1
C119	2.33	-	-	-	-	-	-	-	-	2.5	-	2.66	-	-	1

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Environmental Science (C1110)

Upon completing this course, the student will be able to:

C1110.1: Understanding the importance of ecological balance for sustainable development.

C1110.2: Understanding the impacts of developmental activities and mitigation measures.

C1110.3: Understanding the environmental policies and regulations.

C1110.4: Develop environmental regulations which in turn help in sustainable development.

C1110.5: Develop technologies on the basis of ecological principles.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C1110.1	-	-	-	-	-	-	2	-	-	-	-	-	-	-	1
C1110.2	-	-	-	-	-	-	3	-	-	-	-	-	-	-	1
C1110.3	-	-	-	-	-	-	2	-	-	-	-	-	-	-	1
C1110.4	-	-	-	-	-	-	3	-	-	-	-	-	-	-	1
C1110.5	-	-	-	-	-	-	2	-	-	-	-	-	-	-	1
C1110	-	-	-	-	-	-	2.40	-	-	-	-	-	-	-	1

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Ordinary Differential Equations and Vector Calculus (C121)

Upon completing this course, the student will be able to:

C121.1: The students will apply the fundamental concepts of ODE and formulate and solve differential equation problems in the field of engineering.

C121.2: Predict the suitable method to solve second and higher order differential equations.

C121.3: Prepare to evaluate multiple integrals in rectangular, polar, spherical and cylindrical coordinates.

C121.4: The students will understand the basics of vector differentiation and vector integration.

C121.5: Apply Gauss Divergence theorem for evaluating the surface integral.

CO- PO& PSO Mapping

PO / CO	PO 1	PO2	PO3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C121.1	3	3	-	3	-	-	-	-	-	-	-	-	-	-	-
C121.2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
C121.3	3	3	-	3	-	-	-	-	-	-	-	-	1	-	-
C121.4	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-
C121.5	3	2	-	3	-	-	-	-	-	-	-	-	2	-	-
C121	2.80	2.50	-	3.00	-	-	-	-	-	-	-	-	1.33	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Engineering Chemistry (C122)

Upon completing this course, the student will be able to:

C122.1: The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.

C122.2: Students can acquire the knowledge of construction of electrochemical cells used in various batteries, fuel cells and their applications.

C122.3: They can learn the fundamentals and general properties of polymers and other engineering materials.

C122.4: They can able to identify the composition and general characteristics of conventional green fuels.

C122.5: Students can acquire the knowledge on engineering materials like cement, smart materials, lubricants and their application in constructions & health benefits.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	P O4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C122.1	2	2	3	-	-	-	-	-	-	-	-	-	1	-	-
C122.2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C122.3	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-
C122.4	3	3	3	-	-	-	-	-	-	-	-	-	1	-	-
C122.5	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-
C122	2.80	2.75	2.75	-	-	-	-	-	-	-	-	-	1.00	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Computer Aided Engineering Graphics (C123)

Upon completing this course, the student will be able to:

C123.1: Apply the principles of engineering graphics, including scales, conic sections to create technical drawings using both traditional and computer-aided drafting tools.

C123.2: Demonstrate the principles and conventions of orthographic projections by accurately projecting points, lines, and geometric figures using both manual and computer-aided drafting techniques.

C123.3: Create auxiliary views and sectional views of regular solids (prism, cylinder, pyramid, cone) and represent them accurately using computer-aided drafting tools.

C123.4: Utilize computer-aided drafting tools to develop surfaces of right regular solids (prism, cylinder, pyramid, and cone) for technical drawings and manufacturing processes.

C123.5: Apply the principles and conventions of isometric projections to generate isometric views of lines, plane figures, solids, and spherical parts, and convert between isometric and orthographic views using computer-aided drafting.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C123.1	3	1	-	-	1	-	-	-	-	-	-	-	-	-	-
C123.2	2	2	-	-	2	-	-	-	-	-	-	-	-	1	-
C123.3	2	3	-	-	3	-	-	-	-	-	-	-	-	1	-
C123.4	2	3	-	-	2	-	-	-	-	-	-	-	-	2	-
C123.5	3	3	-	-	3	-	-	-	-	-	-	-	-	-	-
C123	2.40	2.40	-	-	2.20	-	-	-	-	-	-	-	-	1.33	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Basic Electrical Engineering (C124)

Upon completing this course, the student will be able to:

C124.1: Students will be able to analyze and solve DC electrical circuits using network laws and theorems.

C124.2: Students will be able to analyze and solve AC electrical circuits using network laws and theorems.

C124.3: Students will be able to understand and analyze the working of static device.

C124.4: Students will be able to study the working principles of AC Machines.

C124.5: Students can acquire the knowledge on introduce components of Low Voltage Electrical Installations.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	P O4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C124.1	3	3	2	-	-	-	-	-	-	-	-	-	2	-	-
C124.2	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
C124.3	2	1	-	-	-	-	-	-	-	-	-	-	1	-	-
C124.4	3	-	3	-	-	-	-	-	-	-	-	-	2	-	-
C124.5	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-
C124	2.25	2.00	2.00	-	-	-	-	-	-	-	-	-	1.40	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Electronic Devices and Circuits (C125)

Upon completing this course, the student will be able to:

C125.1: Acquire the knowledge of diode with the help of V-I characteristics.

C125.2: Analyze the applications of diode.

C125.3: Understand the principle of operation of BJT.

C125.4: Know the characteristics of BJT under various biasing conditions.

C125.5: Interpret the construction, operation and characteristics of FET.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	P O4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C125.1	3	2	-	-	-	-	-	-	-	-	-	-	1	-	-
C125.2	3	-	3	-	-	-	-	-	-	-	-	-	1	-	-
C125.3	2	3	-	-	-	-	-	-	-	-	-	-	1	-	-
C125.4	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-
C125.5	2	1	3	-	-	-	-	-	-	-	-	-	1	-	-
C125	2.20	2.00	2.33	-	-	-	-	-	-	-	-	-	1.00	-	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Applied Python Programming Lab (C126)

Upon completing this course, the student will be able to:

C126.1: Develop the application specific codes using python.

C126.2: Understand Strings, Lists, Tuples and Dictionaries in Python.

C126.3: Understand Functions in Python.

C126.4: Verify programs using modular approach, file I/O.

C126.5: Evaluate programs using Python standard library

C126.6: Implement Digital Systems using Python

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C126.1	2	3	-	-		-	-	-	-	-	-	2	-	2	-
C126.2	2	-	3	-	3	-	-	-	-	-	-	2	-	-	2
C126.3	3	3	2	-	2	-	-	-	-	-	-	1	-	3	3
C126.4	1	3	-	-	2	-	-	-	-	-	-	3	-	-	2
C126.5	3	-	-	-	3	-	-	-	-	-	-	3	-	-	-
C126.6	-	2	-	-		-	-	-	-	-	-	3	-	1	2
C126	2.2	2.75	2.5	-	2.5	-	-	-	-	-	-	2.33	-	2	2.25

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Engineering Chemistry Lab (C127)

Upon completing this course, the student will be able to:

C127.1: Determination of parameters like hardness of water by the complexometric titrations.

C127.2: Students can able to perform the methods such as conductometry, pH metry to find out concentration of unknown solutions.

C127.3: Students can determine the Potentiometry in order to find out the concentrations of acids and bases.

C127.4: Students are able to synthesise Polymers-Bakelite & Nylon-6.

C127.5: Students can estimate the acid value and viscosity of the lubricants.

C127.6: Students can able to identify the suitable inhibitor for corrosion resistance.

C127.7: Students able to understand the function of cells.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO1 2	PSO 1	PSO 2	PSO 3
C127.1	2	-	2	-	-	-	-	-	-	-	-	-	-	1	-
C127.2	2	2	-	-	-	-	-	-	-	-	-	-	-	1	-
C127.3	3	2	-	-	-	-	-	-	-	-	-	-	-	1	-
C127.4	2	-	3	-	-	-	-	-	-	-	-	-	-	1	-
C127.5	3	3	-	-	-	-	-	-	-	-	-	-	-	1	-
C127.6	2	3	3	-	-	-	-	-	-	-	-	-	-	1	-
C127.7	3	-	2	-	-	-	-	-	-	-	-	-	-	1	-
C127	2.42	2.5	2.5	-	-	-	-	-	-	-	-	-	-	1	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Basic Electrical Engineering lab (C128)

Upon completing this course, the student will be able to:

C128.1: Students are able to learn the how to Apply the basic circuits laws and simplify the network using reduction techniques.

C128.2: Students can Understand time domain analysis, resonance in RLC parameters and evaluate impedance in RLC circuit.

C128.3: Students can determine the working concept, Select range of apparatus based on the ratings of different machines like transformers and motors.

C128.4: Students can Determine efficiency and regulation of transformers by various test.

C128.5: Students can estimate the performance characteristics of dc shunt motor.

C128.6: Students can able to identify the 3 phase power, torque speed characteristics of 3 phase induction motor.

CO-PO & PSO Mappings:

PO / CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C128.1	3	3	2	-	-	-	-	-		-	-	2	-	2	-
C128.2	3	3	2	-	-	-	-	-	2	-	-	2	-	-	-
C128.3	3	-	-	-	-	-	-	-	3	-	-	3	-	3	-
C128.4	2	3	3	-	-	-	-	-	-	-	-	2	-	1	-
C128.5	2	3	3	-	-	-	-	-	2	-	-	2	-	2	-
C128.6	2	3	1	-	-	-	-	-		-	-	2	-	2	-
C128	2.5	3	2.2	-	-	-	-	-	2.33	-	-	2.2	-	2	-

Level of Mapping: High -3, Medium -2, Low-1

Faculty

Course Outcomes

Course Name: Electronic Devices and Circuits Lab (C129)

Upon completing this course, the student will be able to:

C129.1: Understand the characteristics and operation of semiconductor devices such as diodes, transistors, and special-purpose devices.

C129.2: Analyze the design and biasing requirements of semiconductor devices to ensure proper functionality in electronic circuits.

C129.3: Demonstrate the ability to design and verify the operation of basic rectifiers, clippers, and clampers for practical applications.

C129.4: Evaluate the performance and switching characteristics of transistors and MOSFETs in different configurations.

C129.5: Explore the characteristics and applications of special-purpose devices such as SCRs, UJTs, photodiodes, and solar cells in real-world scenarios.

C129.6: Acquire the knowledge of various semiconductor devices and their use in real life.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
C129.1	2	2		-	-	-	-	-		-	-	3	-	2	-
C129.2	2	1	2	-	3	-	-	-	3	-	-	2	-	1	1
C129.3	3	3	3	-	-	-	-	-	2	-	-	3	-	-	2
C129.4	2	3	-	-	3	-	-	-	2	-	-	3	-	3	-
C129.5	3	-	-	-	-	-	-	-	3	-	-	3	-	2	2
C129.6	2	2	-	-	2	-	-	-		-	-	2	-	1	-
C129	2.33	2.25	2.5	-	2.66	-	-	-	2.5	-	-	2.66	-	1.8	1.66

Level of Mapping: High -3, Medium -2, Low-1

Faculty