Course Outcomes

Course Name: Electronic Devices and Circuits (C211)

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

C211.1: Describe the basics of Diodes and Rectifiers with different Filters and analyse their characteristic parameters.

C211.2: Explain the construction, working of BJT in different configurations and analyse different biasing and stabilization techniques.

C211.3: Explain the working of JFET and analyse the characteristics of special Purpose Devices.

C211.4: Design of Small Signal Low Frequency BJT Amplifiers.

C211.5: Design of FET Amplifiers and describe the construction, working of MOSFET.

Mapping of course outcomes with program outcomes:

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	2	1	1	-	-	-	-	-	-	-	-	2	-	-
C211.2	3	3	2	2	-	-	-	-	-	-	-	-	2	-	-
C211.3	2	3	3	1	-	-	-	-	-	-	-	-	2	-	-
C211.4	2	3	3	-	-	-	-	-	-	-	-	-	2	-	-
C211.5	2	2	3	-	-	-	-	-	-	-	-	-	2	-	-
C211	2.4	2.6	2.4	1.33	-	-	-	-	-	-	-	-	2	-	-

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

Faculty

Course Outcomes

Course Name: Network Analysis & Transmission Lines (C212)

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

C212.1: Analyze the network topologies with electrical components.

C212.2: Analyze the steady state and transient response of RLC circuits.

C212.3: Describe the characteristics of two port network parameters.

C212.4: Examine the various transmission line parameters and configurations.

C212.5: Examine the Transmission line using Smith Chart with impedance considerations.

Mapping of course outcomes with program outcomes:

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C212.1	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
C212.2	3	2	3	-	-	-	-	-	-	-	-	-	1	-	-
C212.3	2	3	2	-	-	-	-	-	-	-	-	-	2	-	-
C212.4	2	2	2	-	-	-	-	-	-	-	-	-	2	-	-
C212.5	-	2	2	-	-	-	-	-	-	-	-	-	1	-	-
C212	2.2	2.2	2.2	-	-	-	-	-	-	-	-	-	1.5	-	-

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

Faculty

Course Outcomes

Course Name: Digital System Design (C213)

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

C213.1: Classify the number systems and solve the Boolean expressions using the theorems and postulates of Boolean algebra.

C213.2: Solve the Boolean Expressions using mapping method (K-Map) and tabular method.

C213.3: Design and Analyse the Combinational and Sequential circuits.

C213.4: Develop various Sequential Circuits using Mealy and Moore Machines.

C213.5: Explain the operation of Registers and Counters and realize the various logic gates using Diodes and Transistors.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C213.1	3	3	3	-	-	-	-	-	-	-	-	-	3	-	-
C213.2	3	2	2	-	2	-	-	-	-	-	-	-	3	-	-
C213.3	3	2	3	-	-	-	-	-	-	-	-	-	3	-	-
C213.4	3	2	3	-	2	-	-	-	-	-	-	-	3	-	-
C213.5	3	2	2	-	-	-	-	-	-	-	-	-	3	-	-
C213	3	2.2	2.6	-	2	-	-	-	-	-	-	-	3	-	-

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

Faculty

Course Outcomes

Course Name: Signals & Systems (C214)

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

C214.1: Differentiate various signal functions.

C214.2: Implement an arbitrary signal in time and frequency domain.

C214.3: Describe the characteristics of linear time invariant systems.

C214.4: Examine the signals with different transform techniques.

C214.5: Explain sampling and correlation between two 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
C214.1	3	2	-	2	-	-	-	-	-	-	-	1	3	-	-
C214.2	3	2	2	-	-	-	-	-	-	-	-	-	3	-	-
C214.3	3	2	-	2	-	-	-	-	-	-	-	-	-	-	-
C214.4	3	2	2	2	-	-	-	-	-	-	-	2	3	-	-
C214.5	3	2	2	2	-	-	-	-	-	-	-	2	3	-	-
C214	3	2	2	2	-	-	-	-	-	-	-	1.6	3	-	-

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

Faculty

Course Outcomes

Course Name: Probability Theory & Stochastic Process (C215)

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

C215.1: Explain the concepts of probability, sample space and random variables.

C215.2: Implement the operations on single and multiple random variables.

C215.3: Determine the temporal and Spectral characteristics of random signals.

C215.4: Examine LTI systems driven by stationary random process by using ACFs and PSDs.

C215.5: Describe the concepts of noise and Information Theory in communication 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
C215.1	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
C215.2	3		3	2	-	-	-	-	-	-	-	-	3	-	-
C215.3	3	3	-	2	-	-	-	-	-	-	-	-	-	-	-
C215.4	3	3	3	2	-	-	-	-	-	-	-	-	3	-	-
C215.5	3	2	-	2	-	-	-	-	-	-	-	-	2	-	-
C215	3	2.5	3	2	-	-	-	-	-	-	-	-	2.6	-	-

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

Faculty

Course Outcomes

Course Name: Electronic Devices & Circuits Lab (C216)

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

C216.1: Understand the characteristics and operation of semiconductor devices such as diodes, transistors, and special-purpose devices.

C216.2: Demonstrate the ability to design and verify the operation of basic rectifiers, clippers, and clampers for practical applications.

C216.3: Evaluate the performance and switching characteristics of BJT and FET in different configurations.

C216.4: Analyze the design and biasing requirements of semiconductor devices to ensure proper functionality in electronic circuits.

C216.5: Examine the h-parameters of transistor in CB, CE, CC 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
C216.1	1	-	2	-	3	-	-	-	2	-	-	1	3	3	-
C216.2	1	-	3	-	3	-	-	-	2	-	-	1	3	3	-
C216.3	1	-	2	2	3	-	-	-	2	-	-	1	3	3	-
C216.4	1	2	2	-	3	-	-	-	2	-	-	1	3	3	-
C216.5	1	-	2	2	3	-	-	-	2	-	-	1	3	3	-
C216	1	2	2.2	2	3	-	-	-	2	-	-	1	3	3	-

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

Faculty

Course Outcomes

Course Name: Digital System Design Lab (C217)

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

C217.1: Implement the Boolean expressions using gates and design the basic gates using universal gates.

C217.2: Define Postulates of Boolean algebra and to minimize combinational functions, and design the combinational circuits.

C217.3: Design and analyze the shift registers and counters using Flip flops.

C217.4: Design the sequential circuits using a finite state machine.

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	2	2	3	-	2	-	-	-	1	-	-	2	3	3	-
C217.2	2	2	3	-	2	-	-	-	1	-	-	2	3	3	-
C217.3	-	3	3	-	2	-	-	-	1	-	-	2	3	3	-
C217.4	-	3	3	-	2	-	-	-	1	-	-	1	3	3	-
C217	2	2.5	3	-	2	-	-	-	1	-	-	1.7	3	3	-

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: Analyze 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	2	2	3	-	3	-	-	-	2	1	-	1	-	3	-
C218.2	-	2	3	-	3	-	-	-	2	1	-	1	-	3	-
C218.3	1	2	2	2	3	-	-	-	2	1	-	1	-	3	-
C218.4	2	3	3	2	3	-	-	-	2	1	-	1	-	3	-
C218.5	2	3	3	2	3	-	-	-	2	1	-	1	-	3	-
C218.6	2	2	3	-	3	1	-	-	2	1	-	1	-	3	-
C218	1.8	2.5	3	2	3	1	-	-	2	1	-	1	-	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 Mappings:

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:Laplace Transforms, Numerical methods and complex variables (C221)

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

C221.1: Use the Laplace transforms techniques for solving ODE's.

C221.2: Determine the root of a given polynomial and transcendental equations.

C221.3: Solve the value for the given data using interpolation.

C221.4: Determine the numerical solutions for a given first order ODE's.

C221.5: Examine the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems.

C221.6: Express Taylor's and Laurent's series expansions in complex Function.

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	3	-	-	-	-	-	-	-	-	-	2	-	-
C221.2	3	3	2	-	-	-	-	-	-	-	-	-	2	-	-
C221.3	3	3	3	-	-	-	-	-	-	-	-	-	2	-	-
C221.4	3	3	3	-	-	-	-	-	-	-	-	-	2	-	-
C221.5	3	3	3	-	2	-	-	-	-	-	-	-	2	-	-
C221.6	3	3	2	-	2	-	-	-	-	-	-	-	2	-	-
C221	3	2.83	2.66	-	2	-	-	-	-	-	-	-	2	-	-

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

Faculty

Course Outcomes

Course Name: Electromagnetic Fields and Waves (C222)

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

C222.1: Explain about Basic Laws, Concepts and proofs related to Electrostatic Fields.

C222.2: Explain about Basic Laws, Concepts and proofs related to Magnetostatic 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 completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems.

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	-	-	-	-	-	-	-	-	2	-	-
C222.2	3	3	2	1	-	-	-	-	-	-	-	-	2	-	-
C222.3	3	3	3	2	-	-	-	-	-	-	-	-	2	-	-
C222.4	3	3	2	2	-	-	-	-	-	-	-	-	2	-	-
C222.5	3	3	3	1	-	-	-	-	-	-	-	-	2	-	-
C222	3	3	2.4	1.4	-	-	-	-	-	-	-	-	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 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.

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	-	-
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	-	-

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

Faculty

Course Outcomes

Course Name: Linear IC Applications (C224)

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

C224.1: Describe the fundamentals of integrated circuits and Op-amps with linear ICs.

C224.2: Design Op-amp circuits for basic applications and explain the 723 Regulator.

C224.3: Design active filters and oscillators using op-amp.

C224.4: Describe the functional diagram and applications of IC555, IC565.

C224.5: Explain about the various types of data converters.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C224.1	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
C224.2	3	2	3	1	-	-	-	-	-	-	-	-	2	-	-
C224.3	2	3	3	1	-	-	-	-	-	-	-	-	2	-	-
C224.4	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
C224.5	3	2	2	1	-	-	-	-	-	-	-	-	2	-	-
C224	2.8	2.2	2.4	1	-	-	-	-	-	-	-	-	2	-	-

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: Design the multistage amplifiers and describe the concepts of High Frequency Analysis of Transistors.

C225.2: Use the Concepts of negative feedback to improve the stability of amplifiers and positive feedback to generate sustained oscillations.

C225.3: Explain the condition for oscillations, design and analyze different types of oscillators.

C225.4: Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio and Radio applications.

C225.5: Design Multivibrators and sweep circuits for various 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
C225.1	3	3	2	1	-	2	-	-	-	-	-	-	2	-	-
C225.2	3	3	3	1	-	2	-	-	-	-	-	1	2	-	-
C225.3	3	3	3	2	-	2	-	-	-	-	-	1	2	-	-
C225.4	3	3	3	1	-	2	-	-	-	-	-	1	2	-	-
C225.5	3	3	3	1	-	2	-	-	-	-	-	1	2	-	-
C225	3	3	2.8	1.2	-	2	-	-	-	-	-	1	2	-	-

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	2.2	1	3	-	-	-	-	-	-	1	1.75	3	-

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

Faculty

Course Outcomes

Course Name: IC Applications Lab (C227)

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

C227.1: Design and implement various analog circuits using Op-Amp IC 741.

C227.2: Design active filters for the given specifications and obtain their frequency response characteristics.

C227.3: Design and implementation of various Multivibrators using 555 timer.

C227.4: Design waveform generators with ICs 741 and PLL applications using 565.

C227.5: Design and analyse various three terminal voltage regulators-7805, 7809, 7912.

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	1	2	3	2	3	-	-	-	1	-	-	1	3	3	-
C227.2	2	2	3	3	3	-	-	-	1	-	-	1	3	3	-
C227.3	1	2	3	-	3	-	-	-	1	-	-	1	3	3	-
C227.4	2	2	3	2	3	-	-	-	1	-	-	1	3	3	-
C227.5	2	2	3	3	3	-	-	-	1	-	-	1	3	3	-
C227	1.6	2	3	2.5	3	-	-	-	1	-	-	1	3	3	-

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

Faculty

Course Outcomes

Course Name: Electronic circuit Analysis lab (C229)

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

C228.1: Design, simulate and verify the basic amplifier circuits.

C228.2: Design, simulate and verify the feedback amplifier circuits.

C228.3: Design, simulate and verify the oscillator circuits.

C228.4: Design, simulate and verify the power amplifier circuits.

C228.5: Test and verify the multivibrators and sweep circuits.

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	2	3	3	2	3	-	-	-	-	-	-	-	2	3	-
C228.2	2	3	3	2	3	-	-	-	-	-	-	-	2	3	-
C228.3	2	3	3	2	3	-	-	-	-	-	-	-	2	3	-
C228.4	2	3	3	2	3	-	-	-	-	-	-	-	2	3	-
C228.5	2	3	3	2	3	-	-	-	-	-	-	-	2	3	-
C228	2	3	3	2	3	-	-	-	-	-	-	-	2	3	-

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

Faculty

Course Outcomes

Course Name: Gender Sensitization lab (C229)

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

C229.1: Develop students' sensibility with regard to issues of gender in contemporary India.

C229.2: Provide a critical perspective on the socialization of men and women.

C229.3: Explain the students to information about some key biological aspects of genders.

C229.4: Interpret the students to debates on the politics and economics of work.

C229.5: Help students reflect critically on gender violence.

C229.6: Expose students to more egalitarian interactions between men and women.

CO- PO& PSO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C229.1	-	-	-	-	-	2	-	2	-	-	-	-	-	-	1
C229.2	-	-	-	-	-	3	-	3	3	-	-	-	-	-	1
C229.3	-	-	-	-	-	2	-	2	-	-	-	-	-	-	1
C229.4	-	-	-	-	-	-	-	3	2	2	-	-	-	-	1
C229.5	-	-	-	-	-	-	-	2	2	3	-	-	-	-	1
C229.6	-	-	-	-	-	2	-	2	2	2	-	-	-	-	1
C229	-	-	-	-	-	2.25	-	2.33	2.25	2.33	-	-	-	-	1

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

Faculty

Course Outcomes

Course Name: Microprocessors and Microcontrollers (C311)

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

C311.1: Explain 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 explain the serial and bus interface.

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

C311.5: Describe the internal architecture of CORTEX ARM processor 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	3	2	-	2	-	-	-	-	-	1	3	-	-
C311.2	3	2	3	2	-	2	-	-	-	-	-	1	3	-	-
C311.3	3	3	3	2	2	2	-	-	-	-	-	1	3	-	-
C311.4	3	2	3	2	-	1	-	-	-	-	-	1	3	-	-
C311.5	3	2	3	2	-	3	-	-	-	-	-	2	3	-	-
C311	3	2.2	3	2	2	2	-	-	-	-	-	1.2	3	-	-

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

Faculty

Course Outcomes

Course Name: Data Communications and Networks (C312)

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

C312.1: Identify the categories and functions of various data communication networks.

C312.2: Design, implement, and evaluate various error detection and correction techniques.

C312.3: Demonstrate the mechanism of routing the data in the network layer.

C312.4: Examine the significance of various flow control and congestion control mechanisms for efficient data communication.

C312.5: 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
C312.1	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
C312.2	3	3	3	3	2	1	-	-	-	-	-	-	3	-	-
C312.3	2	2	3	2	1	1	-	-	-	-	-	-	2	-	-
C312.4	2	3	2	3	2	-	-	-	-	-	-	-	-	-	-
C312.5	2	1	2	2	-	-	-	-	-	-	-	-	3	-	-
C312	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: 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	-	2	-	-	-	-	-	-	1	2	-	-
C313.2	3	3	-	3	2	-	-	-	-	-	-	1	2	-	-
C313.3	3	3	3	2	2	-	-	-	-	-	-	1	2	-	-
C313.4	3	3	3	2	2	-	-	-	-	-	-	1	2	-	-
C313.5	3	3	3	2	-	-	-	-	-	-	-	1	2	-	-
C313	3	3	3	2.25	2	-	-	-	-	-	-	1	2	-	-

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	1	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	1	2	-	-	-	-	-	-	1	1	-	-

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

Faculty

Course Outcomes

Course Name: Error correcting Codes (C315)

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

C315.1: Identify to transmit and store reliable data and detect errors in data through coding.

C315.2: Describe the designing of various codes like block codes, cyclic codes.

C315.3: Describe the designing of various codes like convolution codes, turbo codes and space codes.

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	-	-	-	-	-	-	-	1	2	-	-
C315.2	3	2	1	1	-	-	-	-	-	-	-	1	2	-	-
C315.3	3	2	1	1	-	-	-	-	-	-	-	1	2	-	-
C315	3	2	1	1	-	-	-	-	-	-	-	1	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: Microprocessors and Microcontrollers Lab (C316)

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

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

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

C316.3: Examine the Interfacing of I/O devices such as Keypad, seven segment display with 8051 microcontrollers.

C316.4: Examine the Interfacing of Sequence Detector, ADC and DAC to 8051 microcontrollers.

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: Data Communications and Networks Lab (C317)

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

C317.1: Analyze the trace files and understand how to evaluate the performance of networking protocols and operations.

C317 .2: Demonstrate the socket program using TCP & UDP.

C317 .3: Develop simple applications using TCP & UDP.

C317 .4: Develop the code for Data link layer protocol simulation.

C317 .5: Examine the performances of routing 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
C317.1	1	2	3	3	-	-	-	-	-	-	-	1	2	3	-
C317.2	1	3	2	3	-	-	-	-	-	-	-	1	2	3	-
C317.3	3	1	3	1	-	-	-	-	-	-	-	1	2	3	-
C317.4	3	2	1	3	-	-	-	-	-	-	-	1	2	3	-
C317.5	3	3	2	2	-	-	-	-	-	-	-	1	2	3	-
C317	2.2	2.2	2.2	2.4	-	-	-	-	-	-	-	1	2	3	-

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

Faculty

Course Outcomes

Course Name: Advanced Communication Skills Lab (C318)

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

C318.1: Enable the development in sharing information about family and friends.

C318.2: Strengthen general comprehending skills and present lucid skills in free reading.

C318.3: Develop flair for any kind of writing with rich vocabulary and proper syntax.

C318.4: Proficiency in writing technical articles and presenting papers on any topic of any genre.

C318.5: Understand the basic grammar techniques and utilize it in enhancing language development.

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	-	-	-
C318	-	-	-	-	-	-	-	-	2	3	-	2	-	-	1.75

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: Explain the mechanism of radiation, definitions of different antenna characteristic parameters and establish their mathematical relations.

C321.2: Characterize the different Point Sources and establish the radiation patterns of different Antennas.

C321.3: Characterize the antennas based on frequency, configure the geometry and establish the radiation patterns of VHF, UHF and Microwave antennas and also antenna arrays.

C321.4: Specify the requirements for microwave measurements and arrange a setup to carry out the antenna far zone pattern and gain measurements.

C321.5: Classify the different wave propagation mechanisms, determine the characteristic features of different wave propagations, and estimate the parameters involved**.**

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
C321.1	3	2	2	2	-	2	1	-	-	-	-	2	3	-	-
C321.2	2	2	3	2	-	1	1	-	-	-	-	2	2	-	-
C321.3	3	2	2	3	-	3	2	-	-	-	-	1	3	-	-
C321.4	3	3	2	3	-	2	1	-	-	-	-	3	1	-	-
C321.5	3	2	2	3	-	1	1	-	-	-	-	1	3	-	-
C321	2.8	2.2	2.2	2.6	-	1.8	1.2	-	-	-	-	1.8	2.4	-	-

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	-	-
C322.3	3	3	3	1	3	-	-	-	-	-	-	1	3	-	-
C322.4	3	3	3	1	3	-	-	-	-	-	-	1	2	-	-
C322.5	3	3	2	3	-	-	-	-	-	-	-	1	3	-	-
C322	3	3	2.4	2	2.66	-	-	-	-	-	-	1	2.6	-	-

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

Faculty

Course Outcomes

Course Name: 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 systems, 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	PO 8	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: Object Oriented Programming through JAVA (C324)

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

C324.1: Describe object oriented concepts and basics of JAVA programming.

C324.2: Explain the use of the packages and interfaces.

C324.3: Implement the concepts of multithread and handle run time errors for java applications.

C324.4: Design real time applications using event handling concepts.

C324.5: Develop real time GUI applications using applet, AWT and swings.

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	1	2	2	2	-	-	-	-	1	1	-	-
C324.2	2	3	3	1	2	2	2	-	-	-	-	1	1	-	-
C324.3	2	2	3	2	2	2	2	-	-	-	-	1	1	-	-
C324.4	2	2	3	2	2	2	2	-	-	-	-	1	1	-	-
C324.5	2	2	3	2	2	2	2	-	-	-	-	1	1	-	-
C324	2.2	2.2	2.8	1.6	2	2	3	-	-	-	-	1	1	-	-

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

Faculty

Course Outcomes

Course Name: Mobile Communications & Networks (C324)

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

C324.1: Explain the evolution of mobile and cellular communication system.

C324.2: Describe the co-channel and non-co-channel interferences.

C324.3: Understand impairments due to multipath fading channel and how to overcome the different fading effects.

C324.4: Interpret cell coverage for signal and traffic, diversity, techniques, frequency management, Channel assignment and types of handoff.

C324.5: Differentiate between cellular and Adhoc Networks and design goals of MAC Layer 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	1	1	-	-	-	-	1	2	-	-
C324.2	3	3	2	2	1	1	1	-	-	-	-	1	2	-	-
C324.3	3	3	2	2	1	1	1	-	-	-	-	1	2	-	-
C324.4	3	3	2	2	1	1	1	-	-	-	-	1	2	-	-
C324.5	3	3	2	2	1	1	1	-	-	-	-	1	2	-	-
C324	3	3	2	2	1	1	1	-	-	-	-	1	2	-	-

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

Faculty

Course Outcomes

Course Name: Embedded System Design (C324)

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

C324.1: Describe the basics of an embedded system

C324.2: Understand the selection procedure of Processors in the embedded domain..

C324.3: Design Procedure for Embedded Firmware.

C324.4: Design the RTOS based embedded system for multitasking.

C324.5: Examine the Correlation between task synchronization and latency issues.

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	-	-	-	-	1	-	-	-	-	-	1	2	-	-
C324.2	3	3	2	2	-	1	-	-	-	-	-	1	2	-	-
C324.3	3	3	3	2	3	1	-	-	-	-	-	1	2	-	-
C324.4	3	3	3	2	3	1	-	-	-	-	-	1	2	-	-
C324.5	3	3	2	2	-	-	-	-	-	-	-	1	2	-	-
C324	3	3	2.5	2	3	1	-	-	-	-	-	1	2	-	-

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

Faculty

Course Outcomes

Course Name: Entrepreneurship (C325)

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

C325.1: Explain the basics of Entrepreneurship.

C325.2: Explain financing and managing the new ventures.

C325.3: Understand schemes and functions of MSME and explain the sick enterprises.

C325.4: Describe production and marketing management.

C325.5: Discuss the strategic perspectives in Entrepreneurship.

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
C325.1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
C325.2	-	-	-	-	-	-	-	-	2	2	2	2	-	-	1
C325.3	-	-	-	-	-	-	-	1	-	-	-	3	-	-	1
C325.4	-	-	-	-	-	-	-	-	-	-	3	-	-	-	1
C325.5	-	-	-	-	-	-	-	-	2	-	-	2	-	-	1
C325	-	-	-	-	-	-	-	1	2	2	2.5	2.3	-	-	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: Understand and generate basic signals and waveforms

C326.2: Analyze noise characteristics and its impact on signals.

C326.3: Perform transformations and spectral analysis of discrete-time signals.

C326.4: Design and implement digital filters for signal processing.

C326.5: Apply sampling and reconstruction techniques for signal conversion.

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	3	-
C326.2	2	3	-	3	-	-	-	-	-	-	-	-	2	3	-
C326.3	3	3	2	3	3	-	-	-	-	-	-	-	2	3	-
C326.4	2	-	3	-	3	-	-	-	-	-	-	-	2	3	-
C326.5	3	2	-	-	3	-	-	-	-	-	-	-	2	3	-
C326	2.4	2.6	2.5	2.6	3	-	-	-	-	-	-	-	2	3	-

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

Faculty

Course Outcomes

Course Name: e-CAD 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. [Apply& Analyze]

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

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

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

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

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: Scripting Languages Lab (C328)

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

C328.1: Design and test programs to solve mathematical problems.

C328.2: Develop programs Using Ruby Script.

C328.3: Develop Programs Using TCL Script.

C328.4: Develop Programs Using Perl Script.

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	2	3	-	3	-	-	-	-	-	-	-	-	2	-
C328.2	1	-	3	-	3	-	-	-	-	-	-	-	-	2	-
C328.3	1	-	3	-	3	-	-	-	-	-	-	-	-	2	-
C328.4	1	-	3	-	3	-	-	-	-	-	-	-	-	2	-
C328	1.5	2	3	-	3	-	-	-	-	-	-	-	-	2	-

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

Faculty

Course Outcomes

Course Name: Environmental Science (C329)

C329.1: Students are able to get the information about the eco-system and also about its functions like food chain ecological pyramids.

C329.2: 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.

C329.3: Students are able to gain the knowledge about the ecosystem diversity, its values and also about the importance endemic species.

C329.4: Students are able to gain the knowledge about the different types of pollutions and their control methods, waste water treatment methods etc

C329.5: 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
C329.1	-	-	-	-	-	1	2	-	-	-	-	-	-	1	-
C329.2	-	1	-	-	-	1	2	-	-	-	-	1	-	1	-
C329.3	-	-	-	-	-	1	2	-	-	-	-	1	-	1	-
C329.4	-	1	-	-	-	2	2	-	-	-	-	-	-	1	-
C329.5	-	-	-	-	-	2	3	-	-	-	-	1	-	1	-
C329	-	1	-	-	-	1.4	2.2	-	-	-	-	1	-	1	-

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

Faculty

Course Outcomes

Course Name: Microwave and Optical Communications (C411)

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

C411.1: Understand power generation at microwave frequencies and derive the performance characteristics.

C411.2: Realize the need for solid-state microwave sources and understand the principles of solid-state devices.

C411.3: Distinguish between the different types of waveguide and ferrite components and select proper components for engineering applications.

C411.4: Understand the utility of S-parameters in microwave component design and learn the measurement procedure of various microwave parameters.

C411.5: Understand the mechanism of light propagation through optical fibers and evaluate their utility in communication 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
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: Artificial neural Networks (C412)

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

C412.1: Describe the similarity of Biological networks and Neural networks.

C412.2: Perform the training of neural networks using various learning rules.

C412.3: Explain the concepts of forward and backward propagations.

C412.4: 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
C412.1	3	3	2	2	1	-	-	-	-	-	-	-	3	-	-
C412.2	3	3	2	2	1	-	-	-	-	-	-	-	3	-	-
C412.3	3	3	2	2	3	-	-	-	-	-	-	-	3	-	-
C412.4	3	3	2	2	3	-	-	-	-	-	-	-	3	-	-
C412	3	3	2	2	2	-	-	-	-	-	-	-	3	-	-

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

Faculty

Course Outcomes

Course Name: Scripting Languages (C412)

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

C412.1: Explain about basics of Linux.

C412.2: Explain about basics of Linux Networking.

C412.3: Use Linux environment and write programs for automation.

C412.4: Understand the concepts of Scripting languages.

C412.5: Develop and run scripts using PERL/TCL/Python.

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	-	-	-	-	-	-	-	2	2	-
C412.2	3	3	2	2	1	-	-	-	-	-	-	-	2	2	-
C412.3	3	3	2	2	3	-	-	-	-	-	-	-	2	2	-
C412.4	3	3	2	2	3	-	-	-	-	-	-	-	2	2	-
C412.5	3	3	2	2	3	-	-	-	-	-	-	-	2	2	-
C412	3	3	2	2	2.2	-	-	-	-	-	-	-	2	2	-

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

Faculty

Course Outcomes

Course Name: Digital Image Processing (C412)

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

C412.1: Explain the steps involved in digital image processing.

C412.2: Explore the fundamental relations between pixels and utility of 2-D transforms in image processer.

C412.3: Interpret the enhancement, segmentation and restoration processes on an image.

C412.4: Implement the various Morphological operations on an image.

C412.5: 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
C412.1	3	1	2	2	-	-	-	-	-	-	-	-	2	-	-
C412.2	3	1	2	2	-	-	-	-	-	-	-	-	2	-	-
C412.3	3	3	2	2	2	-	-	-	-	-	-	-	2	-	-
C412.4	3	3	3	2	3	-	-	-	-	-	-	-	2	-	-
C412.5	3	3	2	2	3	-	-	-	-	-	-	-	2	-	-
C412	3	2.2	2	2	2.6	-	-	-	-	-	-	-	2	-	-

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

Faculty

Course Outcomes

Course Name: Biomedical Instrumentation (C413)

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

C413.1: Discuss bio systems and medical systems from an engineering perspective.

C413.2: 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.

C413.3: Explain the working of various medical instruments and critical care equipment.

C413.4: 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
C413.1	3	2	2	2	-	-	-	-	-	-	-	-	2	-	-
C413.2	3	2	2	2	-	-	-	-	-	-	-	-	2	-	-
C413.3	3	3	2	2	-	-	-	-	-	-	-	-	2	-	-
C413.4	3	3	2	2	-	-	-	-	-	-	-	-	2	-	-
C413	3	2.5	2	2	-	-	-	-	-	-	-	-	2	-	-

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

Faculty

Course Outcomes

Course Name: Data Base management Systems (C413)

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

C413.1: Explain the knowledge of fundamentals of DBMS, database design and normal forms.

C413.2: Execute the basics of SQL for retrieval and management of data.

C413.3: Be acquainted with the basics of transaction processing and concurrency control.

C413.4: Classify the database storage structures and access techniques.

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	2	2	2	-	-	-	-	-	-	-	-	1	-	-
C413.2	3	2	2	2	-	-	-	-	-	-	-	-	1	-	-
C413.3	3	3	2	2	-	-	-	-	-	-	-	-	1	-	-
C413.4	3	3	2	2	-	-	-	-	-	-	-	-	1	-	-
C413	3	2.5	2	2	-	-	-	-	-	-	-	-	1	-	-

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: Python Programming (C414)

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

C414.1: Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.

C414.2: Demonstrate proficiency in handling Strings and File Systems.

C414.3: Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.

C414.4: Interpret the concepts of Object-Oriented Programming as used in Python.

C414.5: Implement exemplary applications related to Network Programming, Web Services and Data bases in Python.

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
C414.1	2	3	3	-	-	-	-	-	-	-	-	-	-	2	-
C414.2	2	2	3	-	-	-	-	-	-	-	-	-	-	-	-
C414.3	3	2	2	-	-	-	-	-	-	-	-	-	-	3	-
C414.4	3	3	-	2	-	-	-	-	-	-	-	-	-	3	-
C414.5	2	2	3	2	3	-	-	-	-	-	-	-	-	2	-
C414	2.4	2.4	2.75	2	3	-	-	-	-	-	-	-	-	2.5	-

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	-	-	-	-	-	-	-	-	-	2
C415.3	-	3	2	-	-	-	-	-	2	-	-	2	-	-	-
C415.4	-	3	-	3	-	-	-	-	-	-	-	-	-	-	3
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: Industry Oriented Mini Project (C417)

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

C417.1: Identify uncertainty of open-ended investigations like technical problems and difficulties in collecting the required data.

C417.2: Operate chip designing and Execution while doing mini project.

C417.3: Examine practical knowledge in spite of theoretical concepts he/she acquired.

C417 .4: Recognize importance of teamwork by working in team while doing projects and improves their communication skills.

C417.5: Differentiate open ended projects and set of practical’s.

C417.6: Select different tools /software’s and protocols which used in the project.

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	2	3	-	3	-	-	-	-	-	-	-	-	-	2	-
C417.2	-	3	3	2	3							-	3	3	-
C417.3	3	3	2	3	3	-	-	-	-	-	-	2	3	3	-
C417.4	-	-	-	-	-	-	-	-	3	3	-	2	-	3	-
C417.5	-	2	-	2	-	-	3	-	-	-	-	2	-	-	3
C417.6	-	-	-	-	3	-	-	-	-	-	-	-	3	3	-
C417	2.5	2.75	2.5	2.5	3	-	3	-	3	3	-	2	3	3	3

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

Faculty

Course Outcomes

Course Name: Seminar (C418)

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

C418.1: Identify emerging topic specific to the programme.

C418.2: Extract the information relevant to the chosen topic.

C418.3: Demonstrate the knowledge using multimedia.

C418.4: Solve the queries with appropriate explanation and elaboration.

C418.5: Develop an effective technical report, providing conclusions and proposing an appropriate future scope.

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
C418.1	2	-	-	2	-	-	-	-	-	-	-	2	2	-	-
C418.2	2	2	-	2	-	-	-	-	-	-	-	2	2	-	-
C418.3	2	2	2	2	3	-	-	-	-	-	-	-	2	-	-
C418.4	-	2	3	2	-	-	-	-	-	-	-	-	2	-	-
C418.5	-	-	3	2	-	-	-	-	-	3	-	3	-	-	3
C418	2	2	2.66	2	3	-	-	-	-	3	-	2.3	2	-	3

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

Faculty

Course Outcomes

Course Name: Project Stage-I (C419)

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

C419.1: Identify problem by conducting a relevant literature survey and establishing requirements.

C419.2: Analyze the identified problem and design an innovative, cost-effective solution using appropriate tools, techniques, and technologies.

C419.3: Develop and implement the proposed solution, and validate its performance through systematic testing and evaluation.

C419.4: Analyze the results comprehensively, derive insightful conclusions, and recommend feasible improvements for future development.

C419.5: Demonstrate strong interpersonal and leadership skills by effectively collaborating with team members and ensuring timely completion of project goals within deadlines through individual contributions.

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
C419.1	3	3	2	2	-	-	-	-	-	-	-	-	3	-	-
C419.2	3	3	3	2	3	-	-	-	-	-	3	-	3	3	-
C419.3	2	2	3	3	3	-	-	-	-	-	-	2	3	3	-
C419.4	-	3	3	3	-	2	-	-	-	-	-	3	-	-	2
C419.5	-	-	3	-	-	-	-	-	3	3	-	-	-	-	3
C419	2.66	2.75	2.8	2.5	3	2	-	-	3	3	3	2.5	3	3	2.5

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

Faculty

Course Outcomes

Course Name: Satellite Communications (C421)

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

C421.1: Understand basic concepts, frequency allocations for satellite communication, orbital mechanics, and launch vehicles.

C421.2: Analyze the satellite subsystems such as attitude control, power systems, and telemetry.

C421.3: Design satellite communication links for specified carrier-to-noise (C/N) ratios.

C421.4: Explore and compare various multiple access techniques for satellite communications and earth station technologies.

C421.5: 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
C421.1	3	2	1	1	-	-	-	-	-	-	-	-	3	-	-
C421.2	3	2	2	2	-	1	-	-	-	-	-	-	3	-	-
C421.3	3	3	3	2	1	1	-	-	-	-	-	-	3	-	-
C421.4	3	3	3	2	2	-	-	-	-	-	-	-	2	-	-
C421.5	3	2	2	2	-	1	-	-	-	-	-	-	3		
C421	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: 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: Wireless Sensor Networks (C421)

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

C421.1: Analyze and compare various architectures of Wireless Sensor Networks.

C421.2: Understand Design issues and challenges in wireless sensor networks.

C421.3: Analyze and compare various data gathering and data dissemination methods.

C421.4: 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
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: System On chip Architecture (C422)

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

C422.1: Expected to understand SOC Architectural features.

C422.2: Acquire the knowledge on processor selection criteria and limitations**.**

C422.3: Acquires the knowledge of memory architectures on SOC**.**

C422.4: Understand the interconnection strategies and their customization on SOC.

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	3	2	2	1	-	-	-	-	-	-	-	3	-	-
C422.2	3	3	2	2	1	-	-	-	-	-	-	-	3	-	-
C422.3	3	3	2	2	3	-	-	-	-	-	-	-	3	-	-
C422.4	3	3	2	2	3	-	-	-	-	-	-	-	3	-	-
C422	3	3	2	2	2	-	-	-	-	-	-	-	3	-	-

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

Faculty

Course Outcomes

Course Name: Test & Testability (C422)

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

C422.1: Acquire the knowledge of fundamental concepts in fault and fault diagnosis.

C422.2: Test pattern generation using LFSR and CA.

C422.3: Design for testability rules and techniques for combinational circuits.

C422.4: Describing scan architectures.

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	3	2	2	1	-	-	-	-	-	-	-	3	-	-
C422.2	3	3	2	2	1	-	-	-	-	-	-	-	3	-	-
C422.3	3	3	2	2	3	-	-	-	-	-	-	-	3	-	-
C422.4	3	3	2	2	3	-	-	-	-	-	-	-	3	-	-
C422	3	3	2	2	2	-	-	-	-	-	-	-	3	-	-

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

Faculty

Course Outcomes

Course Name: Low PowerVLSI Design (C422)

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

C422.1: Understand the need for low power circuit design.

C422.2: Gain knowledge of architectural approaches to low power design.

C422.3: Analyze and design low-voltage, low-power combinational circuits.

C422.4: Design low-voltage, low-power memories.

C422.5: Understand and apply low-power design techniques in sequential 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
C422.1	3	2	2	1	2	-	-	-	-	-	-	2	3	-	-
C422.2	3	2	2	1	2	-	-	-	-	-	-	2	3	-	-
C422.3	3	3	3	2	2	-	-	-	-	-	-	3	3	-	-
C422.4	3	3	3	2	2	-	-	-	-	-	-	3	3	-	-
C422.5	3	2	3	2	2	-	-	-	-	-	-	3	3	-	-
C422	3	2.4	2.6	1.6	2	-	-	-	-	-	-	2.6	3	-	-

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

Faculty

Course Outcomes

Course Name: Environmental impact assessment (C423)

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

C423.1: Appreciate the need for minimizing the environmental impacts of developmental activities.

C423.2: Understand environmental legislation & clearance procedure in the country.

C423.3: Apply various methodologies for assessing the environmental impacts of any developmental activity.

C423.4: Prepare environmental impact assessment.

C423.5: Conduct an environmental audit.

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
C423.1	-	-	-	-	-	2	2	-	-	-	-	-	-	1	-
C423.2	-	-	-	-	-	2	-	-	-	-	-	-	-	1	-
C423.3	2	-	-	1	2	-	3	-	-	-	-	-	-	1	-
C423.4	-	-	-	1	-	2	2	3	-	3	-	-	-	1	-
C423.5	-	-	-	1	1	-	2	2	-	2	-	-	-	1	-
C423	2	-	-	1	1.5	2	2.25	2.5	-	2.5	-	-	-	1	-

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

Faculty

Course Outcomes

Course Name: Project Stage-II (C424)

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

C424.1: Identify problem by conducting a relevant literature survey and establishing requirements.

C424.2: Analyze the identified problem and design an innovative, cost-effective solution using appropriate tools, techniques, and technologies.

C424.3: Develop and implement the proposed solution, and validate its performance through systematic testing and evaluation.

C424.4: Analyze the results comprehensively, derive insightful conclusions, and recommend feasible improvements for future development.

C424.5: Demonstrate strong interpersonal and leadership skills by effectively collaborating with team members and ensuring timely completion of project goals within deadlines through individual contributions.

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
C424.1	3	3	2	2	-	-	-	-	-	-	-	-	3	-	-
C424.2	3	3	3	2	3	-	-	-	-	-	3	-	3	3	-
C424.3	2	2	3	3	3	-	-	-	-	-	-	2	3	3	-
C424.4	-	3	3	3	-	2	-	-	-	-	-	3	-	2	-
C424.5	-	-	3	-	-	-	-	-	3	3	-	-	-	-	3
C424	2.66	2.75	2.8	2.5	3	2	-	-	3	3	3	2.5	3	2.66	3

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

Faculty

Course Outcomes

Course Name: Mathematics-I (C111)

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

C111.1: Represent linear system of equations in matrix form and find its solution.

C111.2: Solve orthogonal transformations to a quadratic form.

C111.3: Examine the nature of sequences & series using a suitable test.

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

C111.5: Evaluate the improper integrals using Beta and Gamma functions.

C111.6: Execute the maxima & minima of multivariable functions using partial derivatives method & Lagrange's multiplier methods.

CO- PO & PSO Mapping

PO / CO	PO1	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
C111.1	2	2	-	2	3	-	-	-	-	-	-	-	2	-	-
C111.2	3	3	-	-	3	-	-	-	-	-	-	1	2	-	-
C111.3	3	3	-	-	-	-	-	-	-	-	-	-	2	-	-
C111.4	3	3	-	3	-	-	-	-	-	-	-	-	2	-	-
C111.5	3	3	-	3	-	-	-	-	-	-	-	-	2	-	-
C111.6	3	3	-	3	3	-	-	-	-	-	-	1	2	-	-
C111	2.83	2.83	-	2.75	3	-	-	-	-	-	-	1	2.00	-	-

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: Examine the importance of semiconductors and their applications such as in solar cells.

C112.3: Describe the working and applications of various optoelectronic devices such as LED and SLD and photo detectors such as solar cells, PIN, APD.

C112.4: Explain the construction and working of lasers and Describe principle of propagation of light in optical fibers and losses associated.

C112.5: Describe various properties of dielectric materials and apply the knowledge of piezo, Ferro and pyro electricity.

C112.6: Describe and apply the concept of magnetic hysteresis and the importance of Maxwell's equations.

CO- PO & PSO Mapping

PO / CO	PO1	PO2	PO3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C112.1	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
C112.2	3	3	1	-	-	-	-	-	-	-	-	-	2	-	-
C112.3	3	3	2	-	-	-	-	-	-	-	-	-	2	-	-
C112.4	3	2	1	-	-	-	-	-	-	-	-	-	2	-	-
C112.5	3	2	1	-	-	-	-	-	-	-	-	-	2	-	-
C112.6	3	3	1	-	-	-	-	-	-	-	-	-	2	-	-
C112	3.00	2.50	1.33	-	-	-	-	-	-	-	-	-	2.00	-	-

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

Faculty

Course Outcomes

Course Name: Programming for Problem Solving (C113)

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

C113.1: Write algorithms and to draw flowcharts for solving problems.

C113.2: Translate the algorithms/flowcharts to programs in C language.

C113.3: Test a given logic and code in C programming language.

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

C113.5: Use arrays, pointers, strings and structures to write C programs.

C113.6: Explain Searching and sorting problems.

CO- PO & PSO Mapping

PO / CO	PO 1	PO2	PO3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO1 2	PS O1	PSO 2	PSO 3
C113.1	3	2	3	2	-	-	-	-	-	-	-	1	2	-	-
C113.2	3	2	3	2	-	-	-	-	-	-	-	1	2	-	-
C113.3	3	2	3	2	-	-	-	-	-	-	-	1	2	-	-
C113.4	2	2	3	2	-	-	-	-	-		-	-	2	-	-
C113.5	2	1	3	1	-	-	-	-	-		-	-	2	-	-
C113.6	2	2	3	2	-	-	-	-	-	-	-	1	2	-	-
C113	2.5	1.83	3.00	1.8	-	-	-	-	-	-	-	1.00	2.00	-	-

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

Faculty

Course Outcomes

Course Name: Engineering Graphics (C114)

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

C114.1: Use basic instruments and construction methods for drawings.

C114.2: Construct any 2-Dimensional drawing using first angle and third angle projection.

C114.3: Design any surface developments and 3-Dimensional objects.

C114.4: Construct any internal sectional views of solid objects.

C114.5: Identify working drawings to communicate ideas and information.

C114.6: Read, understand and interpret engineering drawings.

CO- PO & PSO Mapping

PO / CO	PO1	PO2	PO3	PO4	PO 5	PO 6	PO 7	PO 8	PO9	PO1 0	PO1 1	PO 12	PSO 1	PSO 2	PSO 3
C114.1	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-
C114.2	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
C114.3	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-
C114.4	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
C114.5	-	-	-	-	-	-	-	-	2	3	2	-	1	-	-
C114.6	-	2	3	-	-	-	-	-	2	2	2	-	1	-	-
C114	3.00	2.00	2.50	-	-	-	-	-	2.00	2.50	2.00	-	1.00	-	-

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

Faculty

Course Outcomes

Course Name: Applied Physics Lab (C115)

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

C115.1: Explain the basic quantum mechanical principles and theories.

C115.2: Examine the importance of semiconductors and their applications in latest technologies.

C115.3: Describe the principle of propagation of light in optical fibers and iosses associated.

C115.4: Describe the basic types of dielectric and magnetic materials and apply the knowledge of superconducting phenomenon.

C115.5: Describe the working principle of Solar cells and apply the knowledge of piezo, ferro and pyro electricity.

C115.6: Describe the basic types of dielectric and magnetic materials and the importance of Maxwell equations.

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
C115.1	3	-	-	-	-	-	-	-	-	-	-	-	-	2	-
C115.2	3	2	-	-	-	-	-	-	-	-	-	-	-	2	-
C115.3	3	2	-	-	-	-	-	-	-	-	-	-	-	2	-
C115.4	3	2	-	-	-	-	-	-	-	-	-	-	-	2	-
C115.5	3	-	-	-	-	-	-	-	-	-	-	-	-	2	-
C115.6	3	2	-	-	-	-	-	-	-	-	-	-	-	2	-
C115	3	2	-	-	-	-	-	-	-	-	-	-	-	2	-

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

Faculty

Course Outcomes

Course Name: PPS Lab (C116)

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

C116.1: Write algorithms and to draw flowcharts for solving problems and translate the algorithms/flowcharts to programs in C language.

C116.2: Use functions to develop modular reusable code.

C116.3: Use arrays, pointers, strings and structures to formulate algorithms and programs.

C116.4: Understand Searching and sorting algorithms.

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
C116.1	3	3	3	-	-	-	-	-	-	-	-	-	-	2	-
C116.2	-	-	-	3	-	-	-	-	-	-	-	-	-	2	-
C116.3	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-
C116.4	-	3	3	-	-	-	-	-	-	-	-	-	-	2	-
C116	3	3	3	3	-	-	-	-	-	-	-	-	-	2	-

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

Faculty

Course Outcomes

Course Name: Mathematics-II (C121)

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

C121.1: Examine whether the given differential equation of first order is exact or not.

C121.2: Solve higher differential equation and apply the concept of differential equation to real world problems.

C121.3: Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelepiped.

C121.4: Compute gradient, divergence, curl, and directional derivatives for given scalar and vector functions.

C121.5: Evaluate the line, surface and volume integrals and converting them from one to another.

CO- PO & PSO Mapping

PO / CO	PO1	PO2	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
C121.1	2	2	-	2	3	-	-	-	-	-	-	-	2	-	-
C121.2	3	3	-	-	3	-	-	-	-	-	-	1	2	-	-
C121.3	3	3	-	3	-	-	-	-	-	-	-	-	2	-	-
C121.4	3	3	-	3	-	-	-	-	-	-	-	-	2	-	-
C121.5	3	3	-	3	-	-	-	-	-	-	-	-	2	-	-
C121	2.8	2.8	-	2.75	3	-	-	-	-	-	-	1	2	-	-

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

Faculty

Course Outcomes

Course Name: Chemistry (C122)

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

C122.1: Identify the structural arrangement of atoms in molecules as well as in complex compounds.

C122.2: Differentiate hard and soft water, water purification methods and its significance in industry and daily life.

C122.3: Identify the different corrosion mechanisms occurred in a machines and metals.

C122.4: Identify the reaction mechanism involved in the synthesis of bio-active compounds.

C122.5: Identify the structure of unknown/new compounds with the help of spectroscopy.

C122.6: Ability to identify the suitable reagents (Oxidation & Reductions) for the synthesis of bio-active compounds.

CO- PO & PSO Mapping

PO / CO	PO1	PO2	PO 3	PO4	PO 5	PO6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C122.1	3	2	-	-	-	-	-	-	-	-	-	-	1	-	-
C122.2	3	2	-	-	-	-	-	-	-	-	-	-	1	-	-
C122.3	3	-	-	-	-	2	-	-	-	-	-	-	1	-	-
C122.4	3	2	-	-	-	-	-	-	-	-	-	-	1	-	-
C122.5	3	1	-	-	-	-	-	-	-	-	-	-	1	-	-
C122.6	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-
C122	3.00	1.75	-	-	-	2.00	-	-	-	-	-	-	1.00	-	-

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

Faculty

Course Outcomes

Course Name: Basic Electrical Engineering (C123)

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

C123.1: Analyze and solve DC electrical circuits using network laws and theorems

C123.2: Analyze and solve AC electrical circuits using network laws and theorems

C123.3: Understand and analyze the working of static device

C123.4: Study the working principles of AC Machines

C123.5: Introduce components of Low Voltage Electrical Installations.

C123.6: Study the working principles of DC Machine.

CO- PO & PSO Mapping

PO / CO	PO 1	PO2	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
C123.1	3	3	2	-	-	-	-	-	-	-	-	2	2	-	-
C123.2	3	3	2	-	-	-	-	-	-	-	-	2	2	-	-
C123.3	2	3	-	-	-	-	-	-	-	-	-	-	2	-	-
C123.4	2	-	3	2	-	-	-	-	-	-	-	1	2	-	-
C123.5	-	-	3	2	-	-	-	-	-	-	-	-	2	-	-
C123.6	2	2	3	-	-	-	-	-	-	-	-	1	2	-	-
C123	2.4	2.75	2.6	2	-	-	-	-	-	-	-	1.5	2	-	-

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

Faculty

Course Outcomes

Course Name: Engineering Workshop (C124)

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

C124.1: Study and practice on machine tools and their operations.

C124.2: Demonstrate the manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.

C124.3: Identify suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiselling.

C124.4: Apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiselling.

C124.5: Apply basic electrical engineering knowledge for house wiring practice.

CO- PO & PSO Mapping

PO / CO	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C124.1	2	1	-	-	-	1	2	-	2	-	-	-	1	-	-
C124.2	2	1	-	-	-	1	-	-	2	-	-	-	1	-	-
C124.3	2	1	-	-	-	1	2	-	2	-	-	-	1	-	-
C124.4	2	-	-	-	-	1	2	-	2	-	-	-	1	-	-
C124.5	2	1	-	-	-	1	1	-	2	-	-	-	1	-	-
C124	2	1	-	-	-	1	1.75	-	2	-	-	-	1	-	-

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

Faculty

Course Outcomes

Course Name: English (C125)

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

C125.1: Identify the importance of the Raman Effect and its contribution to the development and progress of the country by reading the Raman Effect

C125.2: Ancient architecture in India. Use English Language effectively in spoken and written forms.

C125.3: Blue jeans. Comprehend the given texts and respond appropriately.

C125.4: What should be eating. Communicate confidently in various contexts and different cultures .

C125.5: How a Chinese Billionaire Built Her Fortune. Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.

CO- PO & PSO Mapping

PO / CO	PO1	PO2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C125.1	3	3	-	-	-	-	-	-	-	-	-	-	-	-	2
C125.2	3	3	-	2	-	-	-	-	-	-	-	-	-	-	2
C125.3	3	3	-	-	-	-	-	-	-	-	-	-	-	-	2
C125.4	2	3	-	2	-	-	-	-	3	-	-	-	-	-	2
C125.5	3	3	-	2	-	-	-	-	-	-	-	-	-	-	2
C125	2.80	3.00	-	2.00	-	-	-	-	3.00	-	-	-	-	-	2.00

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

Faculty

Course Outcomes

Course Name: Engineering Chemistry Lab (C126)

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

C126.1: Determine the hardness and chloride content in water.

C126.2: Identify the organic molecules nature by calculation of Rf value using TCL technique.

C126.3: Recognize the ionic conductance of molecules using conductometric and potentiometric titrations.

C126.4: Determine the viscosity of fuels and oils using Ostwald's viscometer.

C126.5: Determine the surface tention of fuels.

C126.6: Recognize the bio-diesel synthesis using transesterification transformation.

CO- PO & PSO Mapping

PO / CO	PO 1	PO2	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
C126.1	3	-	-	-	-	-	-	-	-	-	-	-	-	1	-
C126.2	3	3	3	-	-	-	-	-	-	-	-	-	-	1	-
C126.3	3	-	-	-	-	-	-	-	-	-	-	-	-	1	-
C126.4	-	3	3	-	-	-	-	-	-	-	-	-	-	1	-
C126.5	2	2	-	-	-	-	-	-	-	-	-	-	-	1	-
C126.6	3	3	-	-	-	-	-	-	-	-	-	-	-	1	-
C126	2.8	2.75	3	-	-	-	-	-	-	-	-	-	-	1	-

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

Faculty

Course Outcomes

Course Name: English Language and Communication Skills Lab (C127)

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

C127.1: Identify the importance of Phonetics.

C127.2: Apply appropriate techniques to build the vocabulary.

C127.3: Develop interest in oral communication.

C127.4: Recognize the importance of intonation in communication.

C127.5: Apply various techniques for effective writing and speaking.

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	PO1 2	PSO 1	PSO 2	PSO 3
C127.1	-	-	-	-	-	-	-	-	3	3	-	-	-	-	2
C127.2	-	-	-	-	-	-	-	1	3	3	-	2	-	-	2
C127.3	-	-	-	-	-	-	-	-	3	3	-	-	-	-	2
C127.4	-	-	-	-	1	-	-	-	3	3	-	3	-	-	2
C127.5	-	-	-	-	-	-	-	1	3	3	-	3	-	-	2
C127	-	-	-	-	1	-	-	1	3	3	-	2.66	-	-	2

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: Develop Electrical Circuits using basic Laws.

C128.2: Draw the response of different types of electrical circuits to different excitations.

C128.3: Solve the relation between basic electrical parameters with different types of connections.

C128.4: Test the performance characteristics of AC electrical machines.

C128.5: Examine the performance characteristics of DC electrical machines.

C128.6: Test the performance characteristics of Transformers.

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
C128.1	3	-	2	-	-	-	-	-	-	-	-	-	-	2	-
C128.2	2	1	3	-	-	-	-	-	-	-	-	-	-	2	-
C128.3	-	3	2	-	-	-	-	-	-	-	-	-	-	2	-
C128.4	3	1	-	2	-	-	-	-	-	-	-	-	-	2	-
C128.5	3	1	-	2	-	-	-	-	-	-	-	-	-	2	-
C128.6	3	1	-	2	-	-	-	-	-	-	-	-	-	2	-
C128	2.8	1.4	2.3	2	-	-	-	-	-	-	-	-	-	2	-

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

Faculty