DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Outcomes for the A.Y 2022-2023

Course Name : Electronic Devices & Circuits		Course Code:C211	Course Year/ Sem : II-I
CO Number	**Course Outcome (CO)**		
C211.1	Describe the applications of diode as rectifier, clippers, and clamper circuits.		
C211.2	Design various switching devices such as transistor, transistor biasing.		
C211.3	Analyze the operation of FET, special devices like Zener, Tunnel, Varactor diode, UJT and SCR.		
C211.4	Define explain transistor hybrid model.		
C211.5	Draw the operation of small signal model FET operation.		
C211.6	Explain the operation of diodes, BJT, FET, Transistor amplifiers.		

Course Name: Network Analysis and Transmission Lines		Course Code:C212	Course Year/ Sem: II-I
CO Number	**Course Outcome (CO)**		
C212.1	Gain the knowledge on basic network elements and magnetic circuits.		
C212.2	Analyze the RLC circuits in detail.		
C212.3	Gain the knowledge in characteristics of two port network parameters (Z, Y, ABCD, h & g).		
C212.4	Gain the knowledge in network function driving point in transfer function using s variables, poles and zeros.		
C212.5	Analyze the transmission line parameters and configurations.		

CO Number	Course Name : Digital System Design — Course Code:C213 — Course Year/ Sem: II-I
	Course Outcome (CO)
C213.1	State the Boolean algebra, different number systems and codes. Change one number system into another number system.
C213.2	Design the different combinational logic circuits. Modify and transform one form of Boolean equation to another form and simplify the Boolean equation in K-Map.
C213.3	Design the different Sequential circuits. Analyze and compare the flip-flops and transform one flip-flop to another flip-flop.
C213.4	Design synchronous and asynchronous counters. Analyze and differentiate the sequential machine
C213.5	Define, Differentiate between logic families and realization of logic gates using diodes and transistors
C213.6	Design the digital system.

CO Number	Course Name : Signals and Systems — Course Code:C214 — Course Year/ Sem: II-I
	Course Outcome (CO)
C214.1	Explain any arbitrary signals in terms of complete sets of orthogonal functions and understands the principles of impulse functions, step function and signal function.
C214.2	Express periodic signals in terms of Fourier series and express the spectrum and express the arbitrary signal (discrete) as Fourier transform to draw the spectrum.
C214.3	Analyze the characteristics of linear time invariant systems.
C214.4	Explain response can be obtained using Laplace transform and Z- Transform, properties and ROC of L.T and Z- Transform.
C214.5	Analyze the Sampling theorem, reconstruction, aliasing, and Nyquist's theorem to represent continuous time signals in discrete time.
C214.6	Compare auto Correlation and cross correlation and concept of power density spectrum

Course Name : Probability Theory and Stochastic Processes		Course Code:C2 15	Course Year/ Sem: II-I
CO Number	**Course Outcome (CO)**		
C215.1	Attain the knowledge of Probability theory and random variables.		
C215.2	Explain the Vector Random variables and joint distribution function.		
C215.3	Understand the response of linear time Invariant system for a Random Processes		
C215.4	Analyze the random variable and random process, its properties.		
C215.5	Determine the Spectral and temporal characteristics of Random Signals.		
C215.6	Analyze the concepts of Noise in Communication systems.		

Course Name : Electronic Devices & Circuits Lab		Course Code:C2 16	Course Year/ Sem: II-I
CO Number	**Course Outcome (CO)**		
C216.1	Describe the applications of diode as rectifier, clippers and clamper circuit.		
C216.2	Design various switching devices such as transistor, transistor biasing.		
C216.3	Analyze the operation of FET, Special devices like Zener, Tunnel. Varactor diode, UJT, SCR.		
C216.4	Define explain transistor hybrid model.		
C216.5	Draw the operation of small signal model FET operation.		
C216.6	Examine the operation of diodes, BJT, FET, Transistor amplifiers		

Course Name : Digital System Design Lab		Course Code:C217	Course Year/ Sem: II-I
CO Number	**Course Outcome (CO)**		
C217.1	Identify the IC configurations of digital circuits.		
C217.2	Verify and compare different types of gates and comparators.		
C217.3	Develop the clock using universal gates.		
C217.4	Design and realization of sequential circuits.		
C217.5	Analyze and implementation of sequential circuits.		
C217.6	Compare combinational and sequential circuits.		

Course Name : Basic Simulation Lab	Course Code:C218	Course Year/ Sem: II-I

CO Number	Course Outcome (CO)
C218.1	Identify the basic operations on matrices.
C218.2	Identify and Analyze the various signals and sequences.
C218.3	Point out even and odd signals and real and imaginary parts of signals.
C218.4	Construct the convolution for signals and sequence, Linear-Non linear and time variant-Invariant of sequences.
C218.5	Compare the auto correlation, cross correlation.
C218.6	Describe sampling and Express the Fourier transform and Laplace transform.

Course Name : Constitution of India	Course Code:C219	Course Year/ Sem: II-I

CO Number	Course Outcome (CO)
C219.1	Understand meaning, features, characteristics of constitution law and constitutionalism.
C219.2	Describe fundamental rights, fundamental duties and its legal status.
C219.3	Describe The constitution powers and status of the President of India
C219.4	Understand Emergency Provisions: National Emergency, President Rule, And Financial Emergency
C219.5	Understand Fundamental Right to Equality, Fundamental Right to certain Freedom under Article 19
C219.6	Describe the Scope of the Right to Life and Personal Liberty under Article 21

Course Name : Laplace Transforms, Numerical Methods& Complex Variables	Course Code:C221	Course Year/ Sem: II-I

CO Number	Course Outcome (CO)
C221.1	Describe the use of Laplace Transform techniques when solving ordinary differential equations.
C221.2	Solve the polynomial and transcendental equations.
C221.3	Determine the Numerical solutions for given ordinary differential equations.
C221.4	Identify the Differential Numerical Methods.

C221.5	Describe the Complex function with their analyticity, integration using Cauchy's Integral and Residue theorems.
C221.6	Discuss the Taylor's and Laurent series expansions.

Course Name: Electromagnetic Fields and Waves	Course Code:C222	Course Year/ Sem: II-II
CO Number	**Course Outcome (CO)**	
C222.1	Apply the basic laws to derive the Maxwell's Equation in Differential and Integral form for solving the engineering problems in Electrostatics.	
C222.2	Describe the knowledge of Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law.	
C222.3	Distinguish between static and Time varying fields, apply these concepts to derive the Maxwell's Equation in Differential, Integral form and boundary conditions for solving the engineering problems.	
C222.4	Analyze the wave equation for good conductors and good dielectrics, criticize and apply the characteristics of uniform plane wave for practical problems.	
C222.5	To analyze the characteristics of Uniform Plane Waves (UPW), determine their propagation parameters and estimate the same for dielectric and dissipative media.	
C222.6	Analyze the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems.	

Course Name : Analog and Digital Communications	Course Code:C223	Course Year/ Sem: II-II
CO Number	**Course Outcome (CO)**	
C223.1	Design various continuous wave modulation and demodulation techniques.	
C223.2	Analyze Frequency Modulation (FM) Techniques.	
C223.3	Analyze Phase Modulation (PM) Techniques.	
C223.4	Design various AM and FM transmitters.	
C223.5	Describe various Pulse Modulation Techniques.	
C223.6	Analyze various digital modulation techniques and baseband transmission.	

Course Name : Linear IC Applications	Course Code:C224	Course Year/ Sem: II-II

CO Number	Course Outcome (CO)
C224.1	Describe the characteristics of Operational Amplifier with linear integrated circuits.
C224.2	Analyze the different applications of Operational Amplifier.
C224.3	Produce the different wave forms of filters and oscillators.
C224.4	Describe the functional diagrams and applications of IC 555 & IC 565.
C224.5	Explain various techniques to design analog to digital converters and digital to analog converters.
C224.6	Design the linear integrated circuits using operational Amplifier.

Course Name : Electronic Circuit Analysis	Course Code:C225	Course Year/ Sem: II-II

CO Number	Course Outcome (CO)
C225.1	Design the multistage amplifiers and develop& analyze transistor amplifier circuits using Hybrid π model at high frequencies.
C225.2	Design of Feedback amplifiers and their frequency response
C225.3	Understand the design of various oscillators such as RC Phase Shift Oscillator, Wein Bridge Oscillator, Crystal, LC oscillator
C225.4	Design and compare various Power amplifiers such as Class A, Class B, Class AB amplifiers, Analysis of various tuned amplifiers etc.
C225.5	Design Multivibrators.
C225.6	Understand sweep circuits for various applications.

Course Name : Analog and Digital Communications Lab	Course Code:C226	Course Year/ Sem: II-II

CO Number	Course Outcome (CO)
C226.1	Identify the basics of analog and digital communication systems.
C226.2	Design and Implement different modulation and demodulation techniques.
C226.3	Analyze and implement analog to digital, digital to analogy converters.

C226.4	Describe practical implementation of baseband modulation techniques.
C226.5	Design and implement different pulse modulation techniques like PAM, PWM and PPM.
C226.6	Compare analog and digital modulation techniques.

Course Name : IC Applications Lab	Course Code:C227	Course Year/ Sem: II-II
CO Number	Course Outcome (CO)	
C227.1	Design inverting and non inverting, adder and subtractor or amplifier using op-amp.	
C227.2	Verify a comparator, Integrator and Differentiator using op-amp and voltage regulator using IC723.	
C227.3	Design active filters, PLL.	
C227.4	Analysis of IC741 waveform generator sine, square, triangular waves.	
C227.5	Design a Monostable, Astable Multivibrator and Schmitt trigger.	
C227.6	Identify and verify the functionalities of the linear integrated circuits.	

Course Name : Electronic Circuit Analysis Lab	Course Code:C228	Course Year/ Sem: II-II
CO Number	Course Outcome (CO)	
C228.1	Design and simulate different BJT amplifiers: CE amplifier, Two stage RC coupled amplifier, Cascode, Darlington pair.	
C228.2	Design and simulate feedback amplifiers: Current shunt feedback amplifier, Voltage series feedback amplifiers.	
C228.3	Design and simulate different oscillators: RC phase shift oscillator, Hartley and colpitt's oscillators.	
C228.4	Design and simulate power amplifiers: Class A power amplifier, Class B complementary symmetry amplifier.	
C228.5	Design Monostable Multivibrator.	
C228.6	Design Miller sweep circuit.	

CO Number	Course Name : Gender Sensitization Lab — Course Code:C229 — Course Year/ Sem: II-II

CO Number	Course Outcome (CO)
C229.1	Develop 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	Determine information about some key biological aspects of genders.
C229.4	Debate on the politics and economics of work.
C229.5	Reflect critically on gender violence.
C229.6	Expose more egalitarian interactions between men and women.

Course Name : Microprocessors & Microcontrollers	Course Code:C311	Course Year/ Sem: III-I

CO Number	Course Outcome (CO)
C311.1	Basic understanding of 8086 microprocessors architectures and its functionalities.
C311.2	Design and develop 8086 Microprocessor based systems for real time applications using low level language like ALP.
C311.3	Basic understanding of 8051 microcontroller's architectures and its functionalities.
C311.4	Discuss the input /output memory interface Serial Communication and Bus Interface device.
C311.5	Analyze the internal architecture of ARM.
C311.6	Classify the internal architecture of CORTEX ARM Processor and MAP ARM Processor.

Course Name : Data Communications and Networks	Course Code:C312	Course Year/ Sem: III-I

CO Number	Course Outcome (CO)
C312.1	Explain conceptual foundation for study of data communication using layered architecture.
C312.2	Analyze network Interface protocol and Design Performance issues in MAC in DLL.
C312.3	Evaluate the functioning of routing algorithm and internetworking.

C312.4	Analyze reliable transmission and analyze the performance of TCP protocols.
C312.5	Demonstrate the significance of various flow control and congestion control mechanisms.
C312.6	Analyze the features and operation of various application layer protocols such as Http, DNS &STMP.

Course Name : Control Systems		Course Code:C313	Course Year/ Sem: III-I
CO Number	**Course Outcome (CO)**		
C313.1	Create mathematical model using Laplace Transform and define the Transfer Function of an LTI system in various ways.		
C313.2	Analyze the response of First and second order systems in time domain using characteristic Equations for feedback control systems, and also evaluate the stability of a system in Time Domain using RH Criterion and Root Locus.		
C313.3	Examine Frequency response analysis of a Control System and Solve the stability of the system using BODE Plots.		
C313.4	Analyze the stability of a system in frequency domain using polar and Nyquist's plots.		
C313.5	Design and implementation of Compensators and Controllers to improve stability.		
C313.6	Design state model of a system and determine the transfer function for Linear Time Variant Systems.		
Course Name : Business Economics & Financial Analysis		Course Code:C314	Course Year/ Sem: III-I
CO Number	**Course Outcome (CO)**		
C314.1	The students will understand various forms of Business and the impact of economic variables on the business.		
C314.2	Understand the significance of elasticity of demand and its forecasting, law of demand and its exceptions and supply analysis.		
C314.3	Understand production analysis function with different variables and cost analysis functions.		
C314.4	To adopt the principles of accounting to record, classify and summarize various transactions in books of accounts for preparation of final accounts.		
C314.5	Understand the Ratio analysis to give an idea about financial forecasting, financial		

	planning, controlling and decision making.
C314.6	Understand the implementation of different structures of markets covering how price-output is determined under different market structures.

Course Name : Electronic Measurements And Instrumentation(PE-I)	Course Code:C315	Course Year/ Sem: III-I
CO Number	**Course Outcome (CO)**	
C315.1	Analyze the various electronic instruments based on their specifications for carrying out a particular task of measurements.	
C315.2	Explain the various types of signal generators, signal analyzers for generating and analyzing various real time signals.	
C315.3	Define the different types of oscilloscopes and the characteristics of the signals.	
C315.4	Compare different types of transducer like piezoelectric and magnetro strictive Transducers.	
C315.5	Define and distinguish the types of bridges and measuring the physical parameters like Humidity, moisture, velocity and force.	
C315.6	Relate the use of measuring instruments in real time applications.	

Course Name : Microprocessors and Micro controllers Lab	Course Code:C316	Course Year/ Sem: III-I
CO Number	**Course Outcome (CO)**	
C316.1	Basic understanding of microprocessors and microcontrollers architectures and its functionalities	
C316.2	Design and develop Microprocessor /microcontroller based systems for real time applications using low level languages like ALP	
C316.3	Basic understanding of 8051 microcontroller s architectures and its functionalities.	
C316.4	Discuss the memory input/output memory interface Serial communication and Bus interface device	
C316.5	Analyze the internal architecture of ARM	
C316.6	Classify the internal architecture of CORTEX ARM processor and MAP ARM processor.	

Course Name : Data Communications and Networks Lab	Course Code:C317	Course Year/ Sem: III-I
CO Number	**Course Outcome (CO)**	
C317.1	Explain Conceptual foundation for study of data communication using layered architecture.	
C317.2	Analyze network Interface protocol and Design Performance issues in MAC in DLL.	
C317.3	Evaluate the functioning of routing algorithm and internetworking.	
C317.4	Analyze reliable transmission and analyze the Performance of TCP protocols.	
C317.5	Demonstrate the significance of various flow control and congestion control mechanisms.	
C317.6	Analyze the features and operation of various application layer protocols such as Http, DNS& STMP.	

Course Name : Advanced Communication skills Lab	Course Code:C318	Course Year/ Sem: III-I
CO Number	**Course Outcome (CO)**	
C318.1	Relate functional English for effective communication comprehend literary text and enrich vocabulary.	
C318.2	Comprehend technical correspondence like writing Resumes', Report Writing, Covering Letter.	
C318.3	Revise and apply the strategies for effective reading and to know the contextual knowledge of vocabulary used.	
C318.4	Compose the technical presentations to enhance Oral skills & public speaking.	
C318.5	Employ intelligibly and express effectively in spoken and written communication.	
C318.6	Appraise the linguistic and communication competencies in facing interviews.	

Course Name : Intellectual Property Rights*	Course Code:C319	Course Year/ Sem: III-I
CO Number	**Course Outcome (CO)**	
C319.1	Understand different types of Intellectual property	
C319.2	Analyze purpose, functions, selection and evaluation of trade marks	
C319.3	Explain Law of copy rights	

C319.4	Explain Law of Patents
C319.5	Understand Trade Secret, Trade secret status and Trade secret Litigations
C319.6	Identify new developments in intellectual property

Course Name : Cyber Security*	Course Code:C3110	Course Year/ Sem: III-I
CO Number	**Course Outcome (CO)**	
C3110.1	Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.	
C3110.2	Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.	
C3110.3	Examine software vulnerabilities and security solutions to reduce the risk of exploitation.	
C3110.4	Analyze the cyber security needs of an organization	
C3110.5	Identify Piracy policy management processes	
C3110.6	The students will be able to understand cyber-attacks, types of cybercrimes, cyber laws and also how to protect them self and ultimately the entire Internet community from such attacks	

Course Name : Antennas and Propagation	Course Code:C321	Course Year/ Sem: III-I
CO Number	**Course Outcome (CO)**	
C321.1	Investigate the different types of antennas like short dipole, half wave dipole, quarter Wave monopole and small loops. And its parameters with mathematical relations.	
C321.2	Design and analysis of folded dipole, yagi uda ,helical and horn antennas based on the Frequency with its radiation pattern.	
C321.3	Design and analysis of micro strip rectangular patch antenna and parabolic reflector Antenna according to the irrelevant feed structure.	
C321.4	Classify the different wave propagation mechanisms, identify their frequency ranges, determine the characteristic features of ground wave, ionosphere wave, space wave, duct and troposphere propagations, and estimate the parameters involved	
C321.5	Interpret the requirement of microwave measurement for antenna far zone pattern and Gain measurements	
C321.6	Understand antenna design and performance parameters	

Course Name : Digital Signal Processing	Course Code:C322	Course Year/ Sem: III-II
CO Number		**Course Outcome (CO)**
C322.1		Understand the LTI system characteristics and Multi rate signal processing.
C322.2		Understand the inter-relationship between DFT and various transforms.
C322.3		Design IIR digital filters for a given specification.
C322.4		Design FIR digital filters for a given specification.
C322.5		Express Z -transform analysis on signals and systems.
C322.6		Understand the significance of various filter structures and effects of round off errors.

Course Name : VLSI Design	Course Code:C323	Course Year/ Sem: III-II
CO Number		**Course Outcome (CO)**
C323.1		Acquire knowledge of the Fabrication of IC using various MOS circuits and can be able to compute electrical properties of MOS circuits.
C323.2		Understand vlsi design flow and design rules for layout of IC.
C323.3		Design various gates, adders, Multipliers and Memories using stick diagrams, layouts.
C323.4		Design various forms of memories.
C323.5		Demonstrate semiconductor IC design such as PLA's, PAL, FPGA, CPLDs.
C323.6		Understand differential strategies for testing of IC's and CMOS.

Course Name : Embedded System Design-PE-II	Course Code:C324	Course Year/ Sem: III-II
CO Number		**Course Outcome (CO)**
C324.1		Describe the basics of an embedded system.
C324.2		Interpret the types of memory and interfacing to external world.
C324.3		Analyze the embedded firmware design approaches.
C324.4		Design the RTOS based embedded system for multitasking.

CO	
C324.5	Express the task communication/synchronization issues.
C324.6	Assess the method of designing an embedded system for any type of application.

Course Name : Industrial Management (OE-I)		Course Code:C325	Course Year/ Sem: III-II
CO Number	Course Outcome (CO)		
C325.1	Write the concepts of management and organization and explain the management theories.		
C325.2	Explain principles and types of plant layout and stores management and stores record.		
C325.3	Explain functions of management, marketing mix and marketing strategies.		
C325.4	What is HRM and Human Resource Planning, Recruitment and selection, Training& development.		
C325.5	Solve network analysis and identify critical path and project crashing using PERT and CPM methods		
C325.6	What is strategic management and contemporary strategic issues.		

Course Name : Digital Signal Processing Lab		Course Code:C326	Course Year/ Sem: III-II
CO Number	Course Outcome (CO)		
C326.1	Apply knowledge of digital filter design for various applications		
C326.2	Analyze various signals in transform domain.		
C326.3	Apply Multi Mate concepts in different areas.		
C326.4	Perform real time experiments on processors such as audio and speak processing.		
C326.5	Work with MATLAB functions.		
C326.6	Analyze and design different signals filters using MATLAB.		

Course Name : e-CAD Lab		Course Code:C327	Course Year/ Sem: III-II
CO Number	Course Outcome (CO)		
C327.1	Design and implement all logic gates.		
C327.2	Design and implement 2 to 4 decoder and 8 to 3 encoder.		

C327.3	Design and implement 8 to 1 multiplex and 1 to 8 demultiplex.
C327.4	Design and implement gray code converter, Comparator, counters and adder.
C327.5	Design and implement flip-flops : SR,D,JK,T.
C327.6	Design Finite state machine.

Course Name : Scripting Languages Lab	Course Code:C328	Course Year/ Sem: III-II
CO Number	**Course Outcome (CO)**	
C328.1	Understand the difference between different languages and programming languages.	
C328.2	Gain some fluency programming in Ruby, perl,TCL.	
C328.3	Write different scripts on numbers and strings.	
C328.4	Understand different functions in perl program.	
C328.5	Gain knowledge on list operations using TCL.	
C328.6	Gain Knowledge on routines in scripting Languages.	

Course Name : Environmental Science*	Course Code:C329	Course Year/ Sem: III-II
CO Number	**Course Outcome (CO)**	
C329.1	Understanding the importance of ecological balance for sustainable development.	
C329.2	Understanding the impacts of developmental activities and mitigation measures.	
C329.3	Understanding the environmental policies and regulations	
C329.4	The Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn help in sustainable development.	
C329.5	About environmental assessment and the stages involved in EIA and the environmental Audi.	
C329.6	The environmental legislations of India and the first global initiatives towards sustainable development	

Course Name : Fundamentals of Artificial Intelligence*	Course Code:C3210	Course Year/ Sem: III-II
CO Number	**Course Outcome (CO)**	
C3210.1	Describe knowledge of building blocks of AI in terms of intelligent agent.	
C3210.2	Identify intelligent algorithm for constraint satisfaction problems and also design intelligent system for game playing using propositional logic to prove theorems.	
C3210.3	Analyze various real life problem domain using logic based techniques and knowledge based systems using first order logic.	
C3210.4	Describe and understand different classical planning algorithm techniques to design AI and enveloping for real world problems.	
C3210.5	Implement a Bayesian network that solves a simple version of problem and also to make probabilistic and qualitative inferences	
C3210.6	Describe the ability to apply AI techniques to solve problems of game playing and machine learning.	

Course Name : Microwave and optical communications	Course Code:C411	Course Year/ Sem: IV-I
CO Number	**Course Outcome (CO)**	
C411.1	Classify O type and M type microwave tubes.	
C411.2	Explain the microwave solid state devices and applications.	
C411.3	Analyze the waveguide components	
C411.4	Illustrate microwave measurements by using microwave bench and S matrix determination.	
C411.5	Explain the basic elements of optical fiber transmission link, types, optical transmitters & receivers.	
C411.6	Describe the significance of microwave and Optical fibers in Communications.	

Course Name : Digital image Processing (PE-III)	Course Code:C412	Course Year/ Sem: IV-I
CO Number	**Course Outcome (CO)**	
C412.1	Define digital image fundamentals, sampling and quantization, relationship between pixels, different types of image transforms.	
C412.2	Design concepts including the topics of filtering And types of operations.	
C412.3	Solve the derivations of different types of Restoration filters.	

C412.4	Compare different types of segmentation and Morphing concepts.
C412.5	Classify compression models and their redundancies.
C412.6	Have the skill base summary to further explore Advance the topics of digital image processing.

Course Name : Network Security and Cryptography(PE-IV)	Course Code:C413	Course Year/ Sem: IV-I
CO Number	**Course Outcome (CO)**	
C413.1	Understand various attacks on the network and understanding the need for security.	
C413.2	Apply various classical encryption techniques on messages and analyze various security services and mechanisms.	
C413.3	Compare and contrast symmetric and asymmetric Key Cryptography systems.	
C413.4	Describe the cryptographic hash functions, message authentication codes and various key management and distribution techniques.	
C413.5	Explain different protocols like SSL, PLS, HTTPS, SSH and various wireless network standards.	
C413.6	Analyze how PGP and S/MIME is used to protect messages transmitted through E-mail and explains IPSEC.	

Course Name : Java Programming(PE-V)	Course Code:C414	Course Year/ Sem: IV-I
CO Number	**Course Outcome (CO)**	
C414.1	Understand oops concepts and basics of java Programming.	
C414.2	The Skill to apply OOP concepts in problem Solving.	
C414.3	Able to develop Error free applications using Exception handling.	
C414.4	Able to develop multi threaded applications with Synchronization.	
C414.5	Solving problems using java collection Framework and io streams.	
C414.6	Creating web applications using applets and GUI	

Course Name : Professional Practice, Law &Ethics		Course Code:C415	Course Year/ Sem: IV-I
CO Number	**Course Outcome (CO)**		
C415.1	Understand importance of values and ethics in their personal lives & professional careers.		
C415.2	Describe basic theories like virtue theory, rights theory, and casuist theory.		
C415.3	Understand professional practices in engineering Field.		
C415.4	Describe central responsibilities of engineers		
C415.5	Understand work place rights and responsibilities.		
C415.6	Analyze various global issues in professional Ethics.		

Course Name : Microwave and Optical Communications Lab		Course Code:C416	Course Year/ Sem: IV-I
CO Number	**Course Outcome (CO)**		
C416.1	Examine the Reflex Klystron and Gunn Diode characteristics		
C416.2	Measurement of Impedance and Characteristics of Directional Coupler.		
C416.3	Solve VSWR, Wave guide Components and impedance of given load		
C416.4	Illustrate Attenuation and Microwave Frequency		
C416.5	Examine the Laser diode and LED characteristics.		
C416.6	Calculate the Numerical Aperture and Data Rate of a Digital Optical Link and also find the losses in optical link.		

Course Name : Industry Oriented Mini Project		Course Code:C417	Course Year/ Sem: IV-I
CO Number	**Course Outcome (CO)**		
C417.1	Identify various technologies and domains for making project.		
C417.2	Analyze the various methodologies and technologies and discuss with the team for solving the problem		
C417.3	Apply technical knowledge and project management skills for solving the problem.		
C417.4	Design and develop hardware and/or software for their project specific problem		

C417.5	Prepare the project reports and justify during presentation and demonstration.

Course Name : Seminar		Course Code:C418	Course Year/ Sem: IV-I
CO Number	**Course Outcome (CO)**		
C418.1	To study research papers for understanding of a new field, in the absence of a textbook, to summarize and review them.		
C418.2	To identify promising new directions of various cutting edge technologies.		
C418.3	Analyze the various methodologies and technologies and discuss with the team for solving the problem		
C418.4	To impart skills in preparing detailed report describing the project and results.		
C418.5	To effectively communicate by making an oral presentation before an evaluation committee		

Course Name : Project Stage-I		Course Code:C419	Course Year/ Sem: IV-I
CO Number	**Course Outcome (CO)**		
C419.1	Identify various technologies and domains for making project.		
C419.2	Analyze the various methodologies and technologies and discuss with the team for solving the problem		
C419.3	Apply technical knowledge and project management skills for solving the problem.		
C419.4	Design and develop hardware and/or software for their project specific problem		
C419.5	Prepare the project reports and justify during presentation and demonstration.		

Course Name : Wireless Sensor Networks(PE-V)		Course Code: C421	Course Year/ Sem: IV-II
CO Number	**Course Outcome (CO)**		
C421.1	Analyze and compare various architectures of Wireless Sensor Networks.		
C421.2	Understand Design issues and challenges in wireless sensor networks.		
C421.3	Design various routing and MAC protocols.		

C421.4	Simulate and Compare the performance of various routing and MAC protocols
C421.5	Compare various data gathering and data dissemination methods.
C421.6	Analyze important hardware and software platforms for WSN's.

Course Name : Low Power VLSI Design (PE-VI)	Course Code: C422	Course Year/ Sem: IV-II
CO Number	Course Outcome (CO)	
C422.1	Carry out research and development in the area of Low Power VLSI circuits.	
C422.2	Apply techniques to improve power consumption of VLSI circuits.	
C422.3	Utilize logic simulation methods to design Low Power VLSI circuits.	
C422.4	Apply logic level, architecture level and system level techniques in various designs to optimize power consumption of the VLSI circuits.	
C422.5	Known the design of Low voltage Low power memories.	
C422.6	Implement practical and state of the art Low Power VLSI design , Suitable for real life and industry applications.	

Course Name : Machine Learning (OE-III)	Course Code: C423	Course Year/ Sem: IV-II
CO Number	Course Outcome (CO)	
C423.1	Understand decision tree learning.	
C423.2	Understand Artificial Neural Networks.	
C423.3	Analyze Bayesian learning.	
C423.4	Implement Computational learning theory.	
C423.5	Learn set of rules in learning.	
C423.6	Understand Analytical learning.	

Course Name : Project stage-II	Course Code: C424	Course Year/ Sem: IV-II
CO Number	**Course Outcome (CO)**	
C424.1	Identify various technologies and domains for making project.	
C424.2	Analyze the various methodologies and technologies and discuss with the team for solving the problem	
C424.3	Apply technical knowledge and project management skills for solving the problem.	
C424.4	Design and develop hardware and/or software for their project specific problem	
C424.5	Prepare the project reports and justify during presentation and demonstration.	