

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**COURSE OUTCOMES
REGULATION –R18**

II YEAR :

Course Name: Electronic Devices and Circuits - EC301PC		Year of Study: 2021-22
After completion of course the student will be able to		
C201.1	Explain and Analyse the different types of diodes, operation and its characteristics	
C201.2	Analyze and design of diode application circuits like rectifiers, filters, clippers and clampers	
C201.3	Summarize types, operation, and characteristics of Transistors like BJT and FET	
C201.4	Analyze and Design biasing circuitry of BJT and FET using diodes and resistors.	

Course Name: Network Analysis and Transmission Lines - EC302PC		Year of Study: 2021-22
After completion of course the student will be able to		
C202.1	Understand the knowledge on Basic network elements.	
C202.2	Analyze the RLC circuit's' behaviour in detail.	
C202.3	Evaluate two port network parameters (Z, Y, ABCD, h & g).	
C202.4	Analyze the transmission line parameters and configurations.	

Course Name: Digital System Design - EC303PC		Year of Study: 2021-22
After completion of course the student will be able to		
C203.1	Translate numeric information in different forms, e.g. different bases, signed integers, various codes	
C203.2	Simplify Boolean expressions using the theorems/postulates, K-Map technique and Tabular Method.	
C203.3	Analyze and Design Combinational Circuits.	
C203.4	Analyze and Design Sequential Circuits.	
C203.5	Realizing logic gates using diodes and transistors.	

Course Name: Signals and Systems - EC304PC		Year of Study: 2021-22
After completion of course the student will be able to		
C204.1	construct arbitrary signal in terms of complete sets of orthogonal functions	
C204.2	Analyze various signals and systems, its operations in time domain and frequency domain	
C204.3	Determine the response of an LTI system to arbitrary input signals.	
C204.4	Apply the concepts of Fourier series, Fourier, Laplace and z-Transforms to solve engineering problem like stability and bandwidth.	
C204.5	Interpret Sample and Reconstruction of Signals	

Course Name: Probability Theory and Stochastic Processes - EC305ES		Year of Study: 2021-22
After completion of course the student will be able to		
C205.1	Solve Simple probabilities using an appropriate sample space by applying probability theorems.	
C205.2	Summarize various standard distributions and also distinguish the probability distribution and density functions for single and multi random variables.	
C205.3	Find the statistical parameters of random variables.	
C205.4	Distinguish the random variables with random processes and evaluate the statistical parameters of Random Processes and LTI system in temporal domain.	
C205.5	Estimate various spectral characteristics of random processes and LTI system.	
C205.6	Understand the concepts of Noise and estimate the information content in Communication systems.	

Course Name: Electronic Devices and Circuits Lab - EC306PC		Year of Study: 2021-22
After completion of course the student will be able to		
C206.1	Measure voltage, frequency and phase of any waveform using CRO	
C206.2	Generate sine, square and triangular waveforms with required frequency and amplitude using function generator	
C206.3	Analyze the characteristics of different electronic devices such as diodes, transistors etc., and simple circuits like rectifiers	
C206.4	Compute frequency response of amplifiers.	

Course Name: Digital System Design Lab - EC307PC		Year of Study: 2021-22
After completion of course the student will be able to		
C207.1	Realizing logic gates.	
C207.2	Design and realization of Combinational Circuits.	
C207.3	Design and realization of Sequential Circuits.	

Course Name: Basic Simulation Lab - EC308ES		Year of Study: 2021-22
After completion of course the student will be able to		
C208.1	Compute various statistical properties of a random noise and verify whether it is stationary.	
C208.2	Demonstrate the basics of MATLAB, know how to write a script file, debugging of file and view the results	
C208.3	Generate various signals, apply for different operations	
C208.4	Find convolution, correlation, DFT, linearity, time invariance and stability.	
C208.5	Compute step, impulse response, locates poles and zeros and observe Gibbs phenomena	

Course Name: Constitution of India - MC309		Year of Study: 2021-22
After completion of course the student will be able to		
C209.1	Understand the emergence and evolution of Indian constitution	
C209.2	Understand the structure and composition of Indian Constitution	
C209.3	Understand and Evaluate the Indian Political scenario amidst the emerging challenges.	
C209.4	Analyse Panchayathi Raj institutions as a medium of decentralization	
C209.5	Understand and analyse the three organs of the state in the contemporary scenario	

Course Name: Laplace Transforms, Numerical Methods & Complex Variables - MA401BS		Year of Study: 2021-22
After completion of course the student will be able to		
C210.1	Find the Laplace transforms techniques for solving ODE's	
C210.2	Find the root of a given equation.	
C210.3	Estimate the value for the given data using interpolation	
C210.4	Find the numerical solutions for a given ODE's	
C210.5	Analyze the complex function with reference to their analyticity, integration using Cauchy's	

Course Name: Electromagnetic Fields and Waves - EC402PC		Year of Study: 2021-22
After completion of course the student will be able to		
C211.1	Analyze Basic Laws, Concepts and proofs related to Electrostatic Fields and Magnetostatic Fields.	
C211.2	Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.	
C211.3	Analyze the Wave Equations for good conductors, good dielectrics and evaluate the UPW Characteristics for several practical media of interest.	
C211.4	Analyze completely the rectangular waveguides, their mode characteristics and design waveguides for solving practical problems.	

Course Name: Analog and Digital Communications - EC403PC		Year of Study: 2021-22
After completion of course the student will be able to		
C212.1	Design and simulate modulation and demodulation of various Analog modulation techniques.	
C212.2	Perform Multiplexing of Band limited signals	
C212.3	Design Generation and detection of PCM and DM waves	
C212.4	Design Generation and demodulation of PAM,PWM and PPM	
C212.5	Implement modulation and demodulation of various shift keying techniques.	

Course Name: Linear IC Applications - EC404PC		Year of Study: 2021-22
After completion of course the student will be able to		
C213.1	Understand the internal block diagram of operational amplifier and its characteristics both ideal and practical.	
C213.2	Illustrate some typical applications of operational amplifiers in linear and non linear modes of operation.	
C213.3	Construct various active filter circuits and oscillators using operational amplifier.	
C213.4	Study the block diagrams of 555 timer and 565 phase locked loops ICs and use them to construct various applications.	
C213.5	Study the techniques of Analog to digital and digital to analog converters and its specifications.	

Course Name: Electronic Circuit Analysis - EC405PC		Year of Study: 2021-22
After completion of course the student will be able to		
C214.1	Design of multistage amplifiers and understand the concepts of High Frequency Analysis of Transistors.	
C214.2	Analyze negative and positive feedback circuits for improving stability and generating sustained oscillations respectively	
C214.3	Design and Realize different classes of power amplifiers & tuned amplifiers useable for audio and Radio applications	
C214.4	Design of Multivibrators and sweep circuits for various applications.	

Course Name: Analog and Digital Communications Lab - EC406PC		Year of Study: 2021-22
After completion of course the student will be able to		
C215.1	Design and simulate modulation and demodulation of various Analog modulation techniques.	
C215.2	Demonstrate different multiplexing techniques	
C215.3	Design Generation and demodulation of PAM,PWM, PPM, PCM and DM	
C215.4	Construct pre-emphasis and de-emphasis circuits	
C215.5	Implement modulation and demodulation of various shift keying techniques and OFDM.	

Course Name: IC Applications Lab - EC407PC		Year of Study: 2021-22
After completion of course the student will be able to		
C216.1	Illustrate some typical applications of operational amplifiers in linear and non linear modes of operation.	
C216.2	Construct various active filter circuits using operational amplifier for various frequency response characteristics.	
C216.3	Study the block diagrams of 555 timer ICs and use them to construct various applications.	
C216.4	Study the block diagrams of 565 phase locked loops ICs and use them to construct various applications.	

Course Name: Electronic Circuit Analysis Lab - EC408PC		Year of Study: 2021-22
After completion of course the student will be able to		
C217.1	Design, simulate and verify the amplifier circuits as per the specifications	
C217.2	Design, simulate and verify oscillator circuits as per the specifications	
C217.3	Demonstrate the basics of SPICE/Multisim tool, know how to create, simulate and verify design.	

Course Name: Gender Sensitization Lab - MC409		Year of Study: 2021-22
After completion of course the student will be able to		
C218.1	Show better understanding of important issues related to gender in contemporary India.	
C218.2	Explain basic dimensions of the biological, sociological, psychological and legal aspects of gender.	
C218.3	Identify how gender discrimination works in our society and how to counter it.	
C218.4	Assess insight into the gendered division of labour and its relation to politics and economics.	
C218.5	Develop a sense of appreciation of women in all walks of life.	

III YEAR :

Course Name: Microprocessors & Microcontrollers - EC501PC		Year of Study: 2021-22
After completion of course the student will be able to		
C301.1	Understands the internal architecture and organization of 8086 and 8051 processors/controllers.	
C301.2	Understands the interfacing techniques to 8086 and 8051	
C301.3	Develop assembly Language programming to design microprocessor/ micro controller based systems.	
C301.4	Understand the internal architecture and organization of ARM CORTEX Processor	

Course Name: Data Communications and Networks - EC502PC		Year of Study: 2021-22
After completion of course the student will be able to		
C302.1	Define Network and its components	
C302.2	Illustrate the functionality of OSI and TCP/IP reference models	
C302.3	Compare different network layer protocols	
C302.4	Evaluate Architecture for Application layer protocols	
C302.5	Choose appropriate protocol for desired communication service	

Course Name: Control Systems - EC503PC		Year of Study: 2021-22
After completion of course the student will be able to		
C303.1	Analyze electromechanical systems using mathematical modelling and calculate its transfer function	
C303.2	Determine Transient and Steady State behavior of systems using standard test signals for steady state errors	
C303.3	Analyze linear and non-linear systems for absolute stability and relative stability	
C303.4	Design a stable control system satisfying requirements of stability and reduced steady state error	
C303.5	Construct the state-space model to test the performance of LTI systems	

Course Name: Business Economics & Financial Analysis - SM504MS		Year of Study: 2021-22
After completion of course the student will be able to		
C304.1	Develop the Knowledge on the various forms of Business.	
C304.2	Assess the economic variables on the Business.	
C304.3	Discuss the terms such as Demand, Supply, Production, Cost, Market Structure and Pricing	
C304.4	Analyze the firm's present financial position with the help of financial ratios.	
C304.5	Assess the firm's financial position by analysing the financial statement of the company	

Course Name: Error Correcting Codes-EC512PE		Year of Study: 2021-22
After completion of course the student will be able to		
C305.1	Be familiar with importance of error correction methods in data communication and storage.	
C305.2	Transmit and store reliable data and detect errors in data through coding.	
C305.3	Understand the designing of various codes like block codes, cyclic codes and convolution codes.	
C305.4	Understand various decoding algorithms in convolutional codes like Viterbi algorithm, Sequential decoding and Majority logic decoding.	
C305.5	Understand the concepts of encoding and decoding of Turbo codes.	
C305.6	Be Familiar with Space time codes and understand the concepts of Diversity and Spatial Multiplexing.	

Course Name: Microprocessors & Microcontrollers Lab - EC505PC		Year of Study: 2021-22
After completion of course the student will be able to		
C306.1	Write assembly language programs for different operations using 8086/8051 instructions	
C306.2	Interface different peripherals with 8086/8051	
C306.3	Perform serial and parallel communication between microprocessors	

Course Name: Data Communications and Networks Lab - EC506PC		Year of Study: 2021-22
After completion of course the student will be able to		
C307.1	Describe the basic knowledge of various network protocol architecture	
C307.2	Identify different components required to build up the networks.	
C307.3	Trace the flow of information from one node to another node in the network.	
C307.4	Design and develop client- server network application.	

Course Name: Advanced Communication Skills Lab - EN508HS		Year of Study: 2021-22
After completion of course the student will be able to		
C308.1	Recall the vocabulary and use them in English language.	
C308.2	Illustrate video-audio visuals to speak English effectively.	
C308.3	Develop different of presentation skills	
C308.4	Determine confidently to communicate in formal way in the placements	
C308.5	Develop vocabulary and enable them to use in their day –to-day life	

course Name: Intellectual Property Rights - MC510		Year of Study: 2021-22
After completion of course the student will be able to		
C309.1	Identify different types of Intellectual Properties (IPs), the right of ownership, scope of protection as well as the ways to create and to extract value from IP	
C309.2	Recognize the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development.	
C309.3	Identify activities and constitute IP infringements and the remedies available to the IP owner and describe the precautions steps to be taken to prevent infringement of proprietary rights in products and technology development	
C309.4	Anticipate and subject to critical analysis arguments relating to the development and reform of intellectual property right institutions and their likely impact on creativity and innovation.	
C309.5	Demonstrate a capacity to identify, apply and assess ownership rights and marketing protection under intellectual property law as applicable to information, ideas, new products and product marketing;	

Course Name: Antennas and Propagation - EC601PC		Year of Study: 2021-22
After completion of course the student will be able to		
C310.1	Estimate the fundamental properties of antennas in order to construct a wireless communication link.	
C310.2	Design and develop antennas required in various wireless communication systems for different frequency bands.	
C310.3	Analyze the radiation characteristics of various antenna array configurations and demonstrate the bench setup for antenna parameter measurement of testing.	
C310.4	Interpret the problems associated with radio wave propagation in the atmosphere	

Course Name: Digital Signal Processing - EC602PC		Year of Study: 2021-22
After completion of course the student will be able to		
C311.1	Understand the LTI system characteristics and Multirate signal processing.	
C311.2	Understand the inter-relationship between DFT and various transforms.	
C311.3	Design a digital filter for a given specification.	
C311.4	Understand the significance of various filter structures and effects of round-off errors.	

Course Name: VLSI Design - EC603PC		Year of Study: 2021-22
After completion of course the student will be able to		
C312.1	Interpret different VLSI fabrication processes and CMOS Logic Design	
C312.2	Construct the layout of any logic circuit which helps to understand and estimate parasitics of any logic circuit	
C312.3	Provide concepts required to gate level design, data path subsystems and array subsystems	
C312.4	Design simple logic circuit using PLA, PAL, FPGA and CPLD	
C312.5	Explain different types of faults that can occur in a system and learn the concept of testing and adding extra hardware to improve testability of system	

Course Name: Object Oriented Programming through Java - EC611PE		Year of Study: 2021-22
After completion of course the student will be able to		
C313.1	Solve problems using Object Oriented approach and implement them using java.	
C313.2	Write efficient programs with multitasking ability and handle exception	
C313.3	Design and create user friendly interface.	
C313.4	Analyse and solve problems using applets	
C313.5	Design GUI based applications by implementing AWT	

Course Name: ENTREPRENEURSHIP-CS600OE		Year of Study: 2021-22
After completion of course the student will be able to		
C314.1	Learn Fundamentals of Entrepreneur	
C314.2	understand the New Venture Creations	
C314.3	Understand the Business. Challenges of MSMEs	
C314.4	understand the various marketing services and Growth of Enterprises	
C314.5	understand the Strategies perspectives in Entrepreneurship	

Course Name: Digital Signal Processing Lab - EC604PC		Year of Study: 2021-22
After completion of course the student will be able to		
C315.1	Design and implement the FIR & IIR filters.	
C315.2	Implement DFT and FFT algorithms.	
C315.3	Plot Frequency Response and Impulse Response of the system.	
C315.4	Design the Multi Rate Signal Processing algorithms.	

Course Name: e – CAD Lab - EC605PC		Year of Study: 2021-22
After completion of course the student will be able to		
C316.1	Demonstrate the usage of Xilinx and CADENCE tool, evaluate the functionality, power dissipation, propagation delay and parasitics.	
C316.2	Design the digital circuits using logic gates and transistors.	
C316.3	Draw the Layouts for various digital modules according to design rules.	
C316.4	Examine Digital Designs on FPGA Board.	

Course Name Scripting Languages Lab - EC606PC		Year of Study: 2021-22
After completion of course the student will be able to		
C317.1	Understand the differences between Scripting languages and Programming languages	
C317.2	Gain some fluency programming in Ruby.	
C317.3	Gain some fluency programming in TCL.	
C317.4	Gain some fluency programming in Perl.	
C317.5	Develop web based Projects.	

Course Name: Environmental Science - MC609		Year of Study: 2021-22
After completion of course the student will be able to		
C318.1	Define the scope and importance of ecosystem, its values and services.	
C318.2	Summarize the significance of various natural resources and its management	
C318.3	Make use of a comprehensive study of the world's biodiversity and the importance of its conservation.	
C318.4	Categorize different types of pollutions, their control measures and effective methods of waste management.	
C318.5	Assess global environmental problems and come out with best possible solutions, interpret environmental laws and sustainable development	

IV YEAR

Course Name: Microwave and Optical Communications - EC701PC		Year of Study: 2021-22
After completion of course the student will be able to		
C401.1	Known power generation at microwave frequencies and derive the performance characteristics.	
C401.2	Realize the need for solid state microwave sources and understand the principles of solid state devices.	
C401.3	Distinguish between the different types of waveguide and ferrite components, and select proper components for engineering applications	
C401.4	Understand the utility of S-parameters in microwave component design and learn the measurement procedure of various microwave parameters.	
C401.5	Understand the mechanism of light propagation through Optical Fibres.	

Course Name: Digital Image Processing - EC713PE		Year of Study: 2021-22
After completion of course the student will be able to		
C402.1	Explore the fundamental relations between pixels and utility of 2-D transforms in image processor.	
C402.2	Understand the different types of image transform techniques	
C402.3	Understand the enhancement, segmentation and restoration processes on an image	
C402.4	Implement the various Morphological operations on an image	
C402.5	Understand the need of compression and evaluation of basic compression algorithms	

Course Name: Network Security and Cryptography - EC723PE		Year of Study: 2021-22
After completion of course the student will be able to		
C403.1	Describe network security fundamental concepts and principles	
C403.2	Encrypt and decrypt messages using block ciphers and network security technology and protocols	
C403.3	Analyze key agreement algorithms to identify their weaknesses	
C403.4	Identify and assess different types of threats, malware, spyware, viruses, vulnerabilities	

Course Name: Python Programming - CS702OE		Year of Study: 2021-22
After completion of course the student will be able to		
C404.1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.	
C404.2	Demonstrate proficiency in handling Strings and File Systems.	
C404.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions	
C404.4	Interpret the concepts of Object-Oriented Programming as used in Python.	
C404.5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.	

Course Name: Professional Practice, Law & Ethics - SM702MS		Year of Study: 2021-22
After completion of course the student will be able to		
C405.1	Understanding basic purpose of profession, professional ethics and various moral and social issues.	
C405.2	Awareness of professional rights and responsibilities of a Engineer, safety and risk benefit analysis of aEngineer	
C405.3	Acquiring knowledge of various roles of Engineer In applying ethical principles at various professional levels	
C405.4	Professional Ethical values and contemporary issues	
C405.5	Excelling in competitive and challenging environment to contribute to industrial growth.	

Course Name: Microwave and Optical Communications Lab - EC703PC		Year of Study: 2021-22
After completion of course the student will be able to		
C406.1	Verify characteristics of Reflex Klystron	
C406.2	Analyze various parameters of Waveguide Components.	
C406.3	Estimate the power measurements of RF Components such as directional Couplers.	
C406.4	Demonstrate characteristics of various optical sources.	
C406.5	Measure data Rate, Numerical Aperture and Losses in Optical Link.	

Course Name: Industrial Oriented Mini Project/ Summer Internship - EC704PC		Year of Study: 2021-22
After completion of course the student will be able to		
C407.1	Formulate a real world problem and develop its requirements	
C407.2	Develop a design solution for a set of requirements	
C407.3	Develop Prototype, Test and validate the design as per requirement	
C407.4	Work as a responsible member and possibly a leader of a team in developing a project	
C407.5	Self learn new tools, algorithms, and/or techniques that contribute to the software solution of the project	

Course Name: Seminar - EC705PC		Year of Study: 2021-22
After completion of course the student will be able to		
C408.1	Distinguish the multiple senses of a subjects (literal and beyond the literal).	
C408.2	Identify and understand assumptions, theses, and arguments that exist in the work of authors.	
C408.3	Evaluate and synthesize evidence in order to draw conclusions consistent with the subject.	
C408.4	Seek and identify confirming and opposing evidence relevant to original and existing theses.	

Course Name: Project Stage-I - EC706PC		Year of Study: 2021-22
After completion of course the student will be able to		
C409.1	Apply Process of Project Development to Analyze the real world problem.	
C409.2	Demonstrate the Emerging technologies for Project Implementation.	
C409.3	Apply various testing techniques and tools to test and Design proto type Models.	
C409.4	Work as a responsible member and possibly a leader of a team in developing a project	
C409.5	Document the project report of various phases for future scope of the project Development.	

Course Name: Satellite Communications - EC811PE		Year of Study: 2021-22
After completion of course the student will be able to		
C410.1	Explain the historical background, basic concepts and frequency allocations for satellite communication	
C410.2	Demonstrate orbital mechanics, launch vehicles and launchers	
C410.3	Analyse the design of satellite links for specified C/N with system design examples & propagation effects.	
C410.4	Interpret satellite sub systems like Telemetry, tracking, command and monitoring power systems & Navigations etc.	
C410.5	Analyse the various multiple access systems for satellite communication system and satellite packet communications.	

Course Name: Test and Testability - EC822PE		Year of Study: 2021-22
After completion of course the student will be able to		
C411.1	To acquire the knowledge of fundamental concepts in fault and fault diagnosis.	
C411.2	Test pattern generation using LFSR and CA	
C411.3	Design for testability rules and techniques for combinational circuits	
C411.4	Introducing scan architectures.	

Course Name: Database Management Systems - CS803OE		Year of Study: 2021-22
After completion of course the student will be able to		
C412.1	Understand basic elements of relational database management system.	
C412.2	Identify the data models for relevant problems.	
C412.3	Design entity relational model and convert into entity relationship diagrams into RDBMS and formulate SQL queries on the data.	
C412.4	Apply normalization development of application software.	
C412.5	Design the transactions ER models.	

Course Name: Project Stage-II - EC801PC		Year of Study: 2021-22
After completion of course the student will be able to		
C413.1	Apply Process of Project Development to Analyze the real world problem.	
C413.2	Demonstrate the Emerging technologies for Project Implementation.	
C413.3	Apply various testing techniques and tools to test and Design proto type Models.	
C413.4	Work as a responsible member and possibly a leader of a team in developing a project	
C413.5	Document the project report of various phases for future scope of the project Development.	

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