

Department of Electronics & Communication Engineering
Academic Year: 2025-26

YEAR:II

SEMESTER:I

REGULATION: R22

Course Name: Analog Circuits

Course Code: 22EC301PC

CO1	Analyze the biasing techniques of transistors
CO2	Extract the equivalent models of transistors
CO3	Design multistage amplifiers and understand the concepts of Frequency Analysis of transistors
CO4	Explain the effect of negative feedback on various amplifier parameters.
CO5	Analyze oscillator circuits to generate audio and radio frequency signals.

Course Name: Network analysis and Synthesis

Course Code:22EC302PC

CO1	Understand behavior of Electric & Magnetic Networks
CO2	Analyze the transient and steady-state responses of the RL, RC and RLC circuits
CO3	Examine various two port network parameters and its characteristics
CO4	Construct various filter networks and attenuators
CO5	Inspect transfer functions of passive elements for network synthesis

Course Name: Digital Logic Design

Course Code:22EC303PC

CO1	Understand number systems and Boolean functions for digital logic.
CO2	Illustrate the minimization of boolean functions and realization of logic families
CO3	Design various Combinational and Sequential logic Circuits
CO4	Build different type of Memories and State Machines.
CO5	Examine different types of Finite State Machines.

Course Name: Signals and Systems

Course Code:22EC304PC

CO1	Interpret any signal in terms of complete set of orthogonal functions and the types of signals
CO2	Analyze the Fourier spectrum using Fourier series and Fourier transforms
CO3	Examine an LTI system and its filter characteristics of a system.
CO4	Analyze Laplace Transforms and Z-Transforms
CO5	Explain the Sampling theorem and Correlation functions

Course Name: Probability Theory and Stochastic Processes**CourseCode:22EC305PC**

CO1	Understand the knowledge of Probability theory and random variables.
CO2	Illustrate the concepts of single & multiple Random Variables.
CO3	Identify the concepts of Random Process and its Characteristics.
CO4	Analyze the various Spectral characteristics of Random Signals.
CO5	Evaluate the concepts of Noise in Communication systems.

Course Name: Analog Circuits Laboratory**Course Code:22EC306PC**

CO1	Determine the Q point on the DC load line and stability factor for various biasing techniques of BJT
CO2	Analyze the Characteristics and Frequency response of various amplifiers
CO3	Analyze and Design negative Feedback amplifiers and Oscillators.

Course Name: Digital logic Design Laboratory**Course Code:22EC307PC**

CO1	Realize and implementation of Boolean functions using digital logic IC's
CO2	Implementation of different combinational logic circuits using IC's
CO3	Realize and implementation of Asynchronous and Synchronous counters using Flip-Flop IC's

Course Name: Basic Simulation Laboratory**Course Code:22EC308PC**

CO1	Simulate operations on various types of signals and sequences
CO2	Analyze signal characteristics in frequency domain and frequency response of an LTI system using Fourier transform
CO3	Inspect the stability of an LTI system using Laplace, Z-transforms and Determine convolution and correlation between signals and sequences

Course Name: Constitution of India**Course Code:22MC309CI**

CO1	Understand the concept of Indian Constitution
CO2	Outline the fundamental rights and Fundamental Duties
CO3	Analyze the Directive Principles of State Policy
CO4	Analyze the distribution of powers between of Union and States
CO5	Know the Emergency Provision of Indian Constitution

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YEAR: III

SEMESTER: I

REGULATION: R22

Course Name: Microcontrollers and Applications

Course Code: 22EC501PC

CO1	Discuss the internal architecture of 8086 microprocessor and 8051 Microcontroller.
CO2	Illustrate how to implement the I/O devices and memory interfaces to 8051 for various applications.
CO3	Explain various communication bus interfaces of microcontrollers.
CO4	Describe the Architecture and Instruction set of ARM Processor.
CO5	Examine the Architectures of Advanced ARM Processors.

Course Name: IoT Architectures and Protocols

Course Code: 22EC502PC

CO1	Describe IoT fundamentals, evolution, growth, and applications.
CO2	Compare M2M and IoT architectures and value chains.
CO3	Identify and explain IoT data link and network layer protocols.
CO4	Use transport and session layer protocols in IoT communication.
CO5	Summarize service layer protocols and security mechanisms in IoT.

Course Name: Data Communications & Networks

Course Code: 22EC512PE

CO1	Discuss the basics of Data Communication with its standard reference models.
CO2	Examine Error Control and Access control methods in Data Link Layer.
CO3	Inspect routing and addressing mechanisms in Network Layer.
CO4	Distinguish various types of Transport Layer Protocols.
CO5	Explain the functions of various Application Layer Protocols.

Course Name: Control Systems

Course Code: 22EC503PC

CO1	Examine the mathematical model of physical systems
CO2	Estimate the system response & stability in Time domain
CO3	Analyze the system response & stability in Frequency domain
CO4	Design different types of controllers and compensators
CO5	Analyze linear time systems using state space representation

Course Name: Antennas and Wave Propagation**Course Code: 22EC504PC**

C01	Examine the fundamentals of antennas and thin linear wire antennas.
C02	Investigate various types of antenna arrays for directivity and gain.
C03	Explain the different methods to measure antenna gain.
C04	Characterize various VHF, UHF and Microwave Antennas.
C05	Distinguish various methods of wave propagation with related parameters.

Course Name: IoT Architectures and Protocols Laboratory**Course Code: 22EC506PC**

C01	Interface various sensors with microcontrollers for data acquisition and transmission.
C02	Implement IoT communication protocols and demonstrate remote control using cloud integration.
C03	Design IoT-based systems and communication protocols.

Course Name: Microcontrollers Laboratory**Course Code: 22EC505PC**

C01	Develop and execute 8086 and 8051 programs to perform various operations.
C02	Design , interface, and program I/O devices.
C03	Build and evaluate embedded applications on Cortex-M3 development boards

Course Name: Advanced Communication Laboratory**Course Code: 22EC507PC**

C01	Proficiently utilize test and measurement equipment to characterize and analyze signals, antennas, and communication systems.
C02	Design , implement, and analyze digital modulation and multiplexing techniques using software tools.
C03	Develop and implement embedded systems for sensor data acquisition and wireless communication using UART and RIME protocols on an ICONT platform, demonstrating an understanding of sensor network principles.

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Academic Year: 2025-26

YEAR: IV

SEMESTER: I

REGULATION: R22

Course Name: Microwave and Optical Communications

Course Code: EC701PC

CO1	Compare O and M microwave tubes, their structures and principles of microwave power generation
CO2	Explain the principles of solid-state devices
CO3	Identify the waveguide components
CO4	Analyse the microwave components by scattering parameters and verify it by measurements.
CO5	Classify optical fibers on basis of core and cladding and analyse the link budget.

Course Name: Biomedical Instrumentation

Course Code: EC721PE

CO1	Make use of bio-systems and medical systems for an engineering perspective
CO2	Identify various techniques/Instruments for measuring physiological parameters
CO3	Apply the Categorize different EEG electrodes and their applications
CO4	Explain about various critical care equipment
CO5	Elaborate principles of medical imaging such as MRI,SPECT,PET,CT

Course Name: AI & Applications

Course Code: 22AM722OE

CO1	Understand digital image processing fundamentals and Analyze images using various transform techniques
CO2	Evaluate various image enhancement techniques in the spatial and frequency domain
CO3	Categorize various techniques for image restoration
CO4	Apply different operators for image segmentation and Morphological operations
CO5	Categorize the performance and characteristics of various image compression models

Course Name: Radar Systems

Course Code: 22EC711PE

CO1	Discuss the Radar fundamentals with its Range performance.
CO2	Examine the Doppler effect in CW and FM-CW Radars.
CO3	Analyze the Performance of MTI and Pulse Doppler Radars.
CO4	Distinguish various types of Tracking Radars.
CO5	Inspect the noise of Matched Filter in Radar receiver.

Course Name: Professional Practice, Law & Ethics**Course Code: SM702MS**

CO1	Understand Professional Ethics & Personal Ethics, code of Ethics, Conflict of Interest. Will able to learn the concept of professionalism, Whistle blowing and the brief introduction of GST
CO2	Identify various techniques/Instruments for measuring physiological parameters. Recognize the element of contract, unlawful and illegal agreement. Will analyze the remedies for breach of contract, sale of goods act 1930 and performance of contract of sales
CO3	Illustrate Arbitration, Conciliation and ADR different forms of laws and the dispute resolution board.; Distinction between conciliation, negotiation, mediation and arbitration, confidentiality
CO4	Enumerate the concept of labor laws and other construction related laws and other different types of ACT (1946, 1947, 1923) and also); RERA Act 2017, NBC 2017
CO5	Understand IPR Copyright, Trademarks, Patents and Designs, Secrets, Piracy in Internet Remedies and procedures in India

Course Name: Microwave and Optical Communications Lab**Course Code: EC703PC**

CO1	Identify and demonstrate the working of various microwave and optical components
CO2	Analyze Microwave Passive Devices by conducting experiments and measuring various parameters
CO3	Analyze the characteristics of Optical semiconductor Sources like LED, LASER Diode, by conducting experiments and measuring various parameters

Course Name: Industrial Oriented Mini Project/Summer Internship**Course Code: EC704PC**

CO1	Demonstrate sound technical knowledge & Domain knowledge of the selected topic
CO2	Plan, communicate, analyze & identify the Problem for the proposed work and collect
CO3	Design the Solution and execute by using engineering approach to overcome the complex problems
CO4	Learn to work as a team and to focus on getting a working project done on time with each student
CO5	Implement and test solutions to trace against the user requirements

Course Name: Seminar**Course Code: EC705PC**

CO1	Enhance Technical Communication Skills
CO2	Collaborate and Engage in Peer Feedback
CO3	Develop for Future Academic or Professional Endeavors

Course Name: Project Stage-I**Course Code: EC706PC**

CO1	Formulate and apply mathematical, science, and engineering principles to solve real-time engineering problems
CO2	Implement the existing technique in domains of VLSI, Image & Signal Processing, Communication, and Embedded system using modern tools and technology
CO3	Validate the obtained results on contemporary issues related to society and the environment