



NPR College of Engineering and Technology

(AN AUTONOMOUS INSTITUTION)

WBA Approved (A.E., C.E., I.T., IEE & Mechanical Engg.) | Accredited by NAAC with 'A' Grade
Recognized by AICTE under 2(B) (100 percent certified) | Approved by All India Council for Technical Education, New Delhi
Affiliated to Anna University, Chennai

Natham, Dindigul (Dist.) - 624 401, Tamil Nadu.

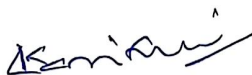


DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

30.12.2025

Programme Outcomes and Course Outcomes for All Programmes Offered by the Institution – Regulation 2023

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Principal

PRINCIPAL
NPR College of Engineering and
Technology (Autonomous)
Natham, Dindigul (Dist.) - 624 401

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM OUTCOMES

PROGRAM OUTCOMES (POs)

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The Engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Code & Title:

As per NPRCET Regulation 2023, the lists of courses are given in the following table.

Table - List of Courses with Course Code:

S.NO.	COURSE CODE (NBA)	COURSE CODE (NPRCET)	TITLE OF THE COURSE
1st Semester			
1	C101	23HS101	Professional English - I
2	C102	23MA101	Matrices and Calculus
3	C103	23PH102	Physics for Electronics Engineering
4	C104	23CY101	Engineering Chemistry
5	C105	23GE101	Problem Solving and C Programming (IC)
6	C106	23GE103	தமிழ்மரபு /Heritage of Tamils
7	C107	23BS112	Physics and Chemistry Laboratory for Electronics Engineering
8	C108	23GE112	English Laboratory -I
2nd Semester			
10	C109	23HS201	Professional English - II
11	C110	23MA203	Partial Differential Equations and Transforms
12	C111	23BE204	Electronic Devices
13	C112	23CS201	Python Programming
14	C113	23EC201	Circuits Analysis (IC)
15	C114	23GE901	Environmental Sciences and Sustainability
16	C115	23GE201	தமிழரும் தொழில்நுட்பமும்/Tamils and Technology
17	C116	23BE213	Electronic Devices Laboratory
18	C117	23CS211	Python Programming Laboratory
19	C118	23GE212	English Laboratory –II
3rd Semester			
20	C201	23MA303	Random Processes and Linear Algebra
21	C202	23AD306	Data Structures using Python
22	C203	23EC301	Electronics Circuits
23	C204	23EC302	Digital System Design (IC)
24	C205	23EC303	Signals and Systems
25	C206	23GE902	Human Values and Ethics
26	C207	23AD313	Data Structures using Python Laboratory
27	C208	23EC311	Circuits Design & Simulation Laboratory
28	C209	23ECA02	PCB Design for IoT Applications
4th Semester			
29	C209	23CS401	Artificial Intelligence & Machine Learning (IC)
30	C210	23EC401	Electromagnetic Fields
31	C211	23EC402	Linear Integrated Circuits
32	C212	23EC403	Digital Signal Processing
33	C213	23EC404	Embedded Systems (IC)
34	C214	23EC405	Control Systems

S.NO.	COURSE CODE (NBA)	COURSE CODE (NPRCET)	TITLE OF THE COURSE
35	C215	23EC411	Linear Integrated Circuits Laboratory
36	C216	23EC412	Digital Signal Processing Laboratory
37	C217	23ECA01	Embedded Systems with Arduino
5th Semester			
38	C301	23EC501	Networks and Security
39	C302	23EC502	Communication Systems
40	C303	23EC503	Transmission Lines and RF Systems
41	C304	23EC504	VLSI Design
42	C305	23PEC12	Multimedia Compression and Communication
43	C306	23OME10	Mechatronics
44	C307	23EC511	Communication Systems Laboratory
45	C308	23EC512	VLSI Design Laboratory
6th Semester			
46	C309	23EC601	IoT Architecture and Systems
47	C310	23EC602	Antenna and Microwave Engineering
48	C311	23EC603	Optical Communication and Networks
49	C312	23PEC22	Medical Imaging Systems
50	C313	23PEC32	4G/5G Communication Networks (IC)
51	C314	23OCS03	Data Science Fundamentals
52	C315	23MC903	Disaster Risk Reduction and Management
53	C316	23EC611	IoT Laboratory
54	C317	23EC612	Optical and Microwave Laboratory
55	C318	23EC613	Mini Project
7th Semester			
56	C406	23EC711	Internship
8th Semester			
57	C407	23EC811	Project Work

Course Outcomes with K – Level mapping for all courses

SEMESTER 1

Course Code & Title: C101 & 23HS101 Professional English - I		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C101.1	Use appropriate words in a professional context and communicate in a professional context.	K3
C101.2	Gain understanding of basic grammatic structures and use them in right context.	K2
C101.3	Read and infer the denotative and connotative meanings of technical texts and use technical words in describing products with appropriate definitions.	K3
C101.4	Write definitions, descriptions, narrations and essays on various topics.	K6
C101.5	Express their opinions effectively in both oral and written medium of communication.	K6

Course Code & Title: C102 & 23MA101 Matrices and Calculus		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C102.1	Use the matrix algebra methods for solving practical problems.	K3
C102.2	Able to use differential calculus ideas on several variable functions.	K3
C102.3	Apply integral calculus and multiple integral tools in solving various application problems.	K3
C102.4	Understand the concepts of Gradient, divergence and curl of a vector point function and related applications.	K2
C102.5	Apply various techniques in solving ordinary differential equations.	K3

Course Code & Title: C103 & 23PH102 Physics for Electronics Engineering		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C103.1	Choose the correct materials based on their qualities for any intended applications and learn the basics of elasticity and its engineering-related applications.	K3
C103.2	Apply quantum theory's sophisticated physics notions to the matter's characterization.	K3
C103.3	Know the fundamentals of crystal formations and growth methods.	K2
C103.4	Understand about the creation of energy band structures, free electron theory, and quantum theory.	K2
C103.5	Gain knowledge about semiconductor and magnetic materials, as well as the applications for them.	K2

Course Code & Title: C104 & 23CY101 Engineering Chemistry		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C104.1	Summarize the water related problems in boilers and their treatment techniques.	K1
C104.2	Discuss the applications of nanomaterials in medicine, agriculture, energy, electronics and catalysis.	K2
C104.3	Discuss the types, properties and applications of polymers and composites.	K3
C104.4	Summarize the fuels used for engineering processes and applications of fuels.	K2
C104.5	Summarize the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.	K3

Course Code & Title: C105 & 23GE101 Problem Solving and C Programming		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C105.1	Understand the basic concepts of C programming tokens, control statements Input/Output statements, and Preprocessor directives.	K2
C105.2	Develop C Programs using basic programming constructs for solving simple problems.	K3
C105.3	Develop C programs for solving computational problems by using arrays and strings.	K3
C105.4	Develop simple real-time applications in C using functions, arrays, and strings.	K3
C105.5	Develop applications for real time problems in C using pointers and structures.	K3

Course Code & Title: C107 & 23BS112 Physics and Chemistry Laboratory for Electronics Engineering		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C107.1	Apprehend the concepts of interference, diffraction of light and recognize the resonance concept of waves.	K2
C107.2	Apply the principles of operations of semiconductor using simple circuits and interaction of electromagnetic waves and crystalline solids.	K3
C107.3	Measure the elastic moduli and moment of inertia of given materials with the help of suggested procedures.	K3
C107.4	Experiment the relationship between the light and matter & properties of liquids.	K4
C107.5	Estimate the velocity of sound and compressibility of liquid.	K2

Course Code & Title: C107 & 23BS112 Physics and Chemistry Laboratory for Electronics Engineering		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C107.1	Analyze the quality of water samples with respect to their acidity, alkalinity, hardness and DO.	K4
C107.2	Determine the amount of metal ions through volumetric and spectroscopic techniques.	K3
C107.3	Analyze and determine the composition of alloys.	K4
C107.4	Learn simple method of synthesis of nanoparticles.	K2
C107.5	Quantitatively analyze the impurities in solution by electroanalytical methods.	K4

Course Code & Title: C108 & 23GE112 English Laboratory -I		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C108.1	Listen to and comprehend general as well as complex academic information.	K2
C108.2	Listen to and understand different points of view in a discussion.	K2
C108.3	Speak fluently and accurately in formal and informal communicative contexts.	K3
C108.4	Describe products and processes and explain their uses and purposes clearly and accurately.	K6
C108.5	Express their opinions effectively in both formal and informal discussions.	K6

SEMESTER 2

Course Code & Title: C109 & 23HS201 Professional English -II		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C109.1	Compare and contrast products and ideas in technical texts and write analytical essays.	K2
C109.2	Identify and report cause and effects in events, industrial processes through technical texts and draft a report with suggestions.	K6
C109.3	Analyze problems in order to arrive at feasible solutions and communicate them in the written format.	K4
C109.4	Present their ideas and opinions in a planned and logical manner in industrial nature.	K6
C109.5	Draft effective resumes in the context of job application.	K6

Course Code & Title: C110 & 23MA203 Partial Differential Equations and Transforms		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C110.1	Apply Partial Differential Equation in real time Engineering problems.	K3
C110.2	Understand general periodic functions and apply in problems of Fourier series, which are sums of sines and cosines.	K2
C110.3	Use the Fourier transform as the tool to connect the time domain and frequency domain in signal processing.	K2
C110.4	Apply Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.	K3
C110.5	Introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z - Transform techniques for discrete time systems.	K2

Course Code & Title: C111 & 23BE204 Electronic Devices		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C111.1	Design simple rectifiers and voltage regulators using diodes	K3
C111.2	Apply suitable biasing conditions to study the input and output characteristics of BJT.	K3
C111.3	Explore the characteristics and operation of JFET and MOSFET.	K2
C111.4	Compare the characteristics of special Semiconductor diodes.	K2
C111.5	Articulate the applications of Power and Display devices.	K2

Course Code & Title: C112 & 23CS201 Python Programming		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C112.1	Develop simple python programs for applying the concepts of data types, expressions, and python statements.	K3
C112.2	Develop Python programs for solving real-time computational problems by using conditionals, looping, functions, and strings.	K3
C112.3	Understand the concepts of compound data using Python lists, tuples, and dictionaries.	K2
C112.4	Develop python programs for solving computational problems by using modules, files, and python packages.	K3
C112.5	Develop python programs for solving computational problems by using Exceptions and Libraries.	K3

Course Code & Title: C113 & 23EC201 Circuits Analysis		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C113.1	Apply the basic concepts of Kirchoff's laws, mesh current and node voltage method for analysis of DC and AC circuits.	K3
C113.2	Apply suitable network theorems to analyze electric circuits.	K3
C113.3	Analyze series, parallel resonance and coupled circuits.	K4
C113.4	Analyze the transient response for any RC, RL and RLC circuits.	K4
C113.5	Analyze the two port network parameters and properties.	K4

Course Code & Title: C114 & 23GE901 Environmental Sciences and Sustainability		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C114.1	Recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.	K1
C114.2	Identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.	K2
C114.3	Identify the causes, effects of natural disasters and contribute to the preventive measures in the society.	K3
C114.4	Identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.	K2
C114.5	Demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.	K3

Course Code & Title: C115 & 23BE213 Electronic Devices Laboratory		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C116.1	Analyze the characteristics of basic electronic devices.	K4
C116.2	Analyze the characteristics of power electronic devices.	K4
C116.3	Analyze the characteristics of electronic devices using simulation software.	K4

Course Code & Title: C116 & 23CS211 Python Programming Laboratory		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C117.1	Develop simple python programs for applying the concepts of datatypes, expressions, and python statements.	K6
C117.2	Develop Python programs using conditionals, looping, functions, and strings for solving real-time computational problems.	K6
C117.3	Understand the concepts of compound data using Python lists, tuples, and dictionaries.	K2
C117.4	Develop python programs for solving problems by using modules, files, and python packages.	K6
C117.5	Utilize Python packages for developing real-world software applications.	K6

Course Code & Title: C116 & 23GE212 English Laboratory -II		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C117.1	Speak effectively in group discussions held in a formal/semiformal contexts.	K6
C117.2	Discuss, analyze and present concepts and problems from various perspectives to arrive at suitable solutions.	K4
C117.3	Make effective presentations in an attractive way using appropriate vocabulary.	K3
C117.4	Attend job interviews and be successful in them.	K6
C117.5	Develop adequate Soft Skills required for the workplace.	K3

SEMESTER3

Course Code & Title: C201 & 23MA303 Random Processes and Linear Algebra		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C201.1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.	K2
C201.2	Understand the basic concepts of two-dimensional random variables and apply in engineering applications.	K2
C201.3	Apply the concept random processes in engineering disciplines.	K3
C201.4	Understand the fundamental concepts of vector space and their role in modern mathematics and applied contexts.	K2
C201.5	Apply the concepts of inner product spaces in engineering field.	K3

Course Code & Title: C202 & 23AD306 Data Structures Using Python		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C202.1	Understanding of Abstract Data Types (ADTs) and their practical implementations.	K2
C202.2	Apply the design and implementation of Lists, Stacks, and Queues to address real-world challenges.	K3
C202.3	Apply in-depth understanding of Sorting, Searching, and Hashing Algorithms for effective Problem Solving.	K3
C202.4	Apply profound understanding of Trees to effectively manage Hierarchical and Interconnected Data.	K3
C202.5	Analyze, Synthesize, and Innovate with Graph Structures for Complex Interconnected Data and Network Solutions	K4

Course Code & Title: C203 & 23EC301 Electronic Circuits		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C203.1	Explain the biasing methods and small signal analysis of transistors.	K2
C203.2	Design and analyze differential and multistage amplifier circuits.	K4
C203.3	Design and analyze feedback amplifiers and oscillators.	K4
C203.4	Design and analyze wave shaping and multivibrator circuits.	K4
C203.5	Design and analyze power amplifiers and supply circuits.	K4

Course Code & Title: C204 & 23EC302 Digital System Design		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C204.1	Use Boolean algebra and simplification procedures relevant to digital logic.	K2
C204.2	Design various combinational digital circuits using logic gates.	K4
C204.3	Analyze and design synchronous sequential circuits.	K4
C204.4	Analyze and design asynchronous sequential circuits.	K4
C204.5	Build logic gates and use programmable devices.	K2

Course Code & Title: C205 & 23EC303 Signals and Systems		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C205.1	Determine if a given system is linear/causal/stable.	K2
C205.2	Analyze continuous time signals using Fourier and Laplace transform.	K4
C205.3	Analyze linear time invariant continuous time systems using Fourier and Laplace transform.	K4
C205.4	Analyze discrete time signals using Fourier and Z transform.	K4
C205.5	Analyze linear time invariant discrete time systems using Fourier and Z transform.	K4

Course Code & Title: C206 & 23GE902 Human Values and Ethics		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C206.1	Understand the importance of democratic values in the harmonious functioning of social life.	K2
C206.2	Build secular values in both their personal and professional life.	K3
C206.3	Build democratic and scientific value in both their personal and professional life.	K3
C206.4	Identify rational solutions to social problems and behave in an ethical manner in society.	K2
C206.5	Build the critical thinking and the pursuit of truth in modern society.	K3

Course Code & Title: C207 & 23AD313 Data Structures Using Python Laboratory		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C207.1	Analyzing and Applying Fundamental Data Structures and Recursive Algorithms in Python	K3
C207.2	Design, implement, and analyzes linear data structures, such as lists, queues, and stacks, according to the needs of different applications.	K6
C207.3	Design, implement, and analyzes efficient tree structures to meet requirements such as searching, indexing, and sorting.	K6
C207.4	Analyzing Graph Representation Methods and Mastering Traversal Algorithms.	K4
C207.5	Design, implement, and analyzes single source shortest path algorithm and minimum spanning tree algorithms.	K6

Course Code & Title: C208 & 23EC311 Circuits Design and Simulation Laboratory		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C208.1	Design and analyze various types of amplifiers.	K4
C208.2	Design and analyze oscillators and wave shaping circuits.	K4
C208.3	Design and simulate tuned amplifiers using SPICE Tool.	K4
C208.4	Design and simulate various types of feedback amplifiers using SPICE Tool.	K4
C208.5	Design and simulate oscillators and multivibrators using SPICE Tool.	K4

Course Code & Title: C209 & 23ECAO2 PCB Design for IoT Applications		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C209.1	Understand the different manufacturing techniques and materials used in PCB production.	K2
C209.2	Use PCB design software essential for creating and modifying PCB designs.	K3
C209.3	Acquire skills for diagnosing and fixing issues that may arise in PCB prototypes or final products.	K3

SEMESTER 4

Course Code & Title: C210 & 23EC401 Electromagnetic fields		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C210.1	Relate the fundamentals of vector algebra, coordinate system to electromagnetic concepts.	K2
C210.2	Interpret the concepts of electric field in material space and solve the boundary conditions.	K2
C210.3	Explain the concepts and characteristics of Magneto Static field in material space and solve boundary conditions.	K3
C210.4	Understand and apply Maxwell's equations to analyze electromagnetic fields, wave propagation, and time-harmonic phenomena in various media.	K4
C210.5	Analyze plane wave propagation, power flow, and boundary interactions in various media.	K4

Course Code & Title: C211 & 23EC402 Linear Integrated Circuits		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C211.1	Understand the basics, fabrication, and characteristics of op-amp ICs, and apply them in inverting, non-inverting, and differential amplifiers.	K3
C211.2	Design the circuits using op-amp for linear and nonlinear applications.	K3
C211.3	Apply the concepts of PLL for various applications and to understand the working of regulators.	K3
C211.4	Interpret the principle of operation of ADC and DAC using op-amps.	K2
C211.5	Design various waveform generators and other circuits using different ICs.	K3

Course Code & Title: C212 & 23EC403 Digital Signal Processing		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C212.1	Analyse discrete time signals using DFT.	K4
C212.2	Implement the digital Infinite Impulse Response filters.	K3
C212.3	Develop the linear phase Finite Impulse Response filters using windowing and frequency sampling techniques.	K3
C212.4	Examine the finite word length effects in digital signal processing.	K4
C212.5	Understand the architecture, addressing modes and instruction sets of Digital Signal Processors.	K2

Course Code & Title: C213 & 23EC404 Embedded Systems		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C213.1	Explain the architecture and features of 8051.	K2
C213.2	Apply ARM processor architecture and programming concepts.	K3
C213.3	Design a model with MSP430 microcontrollers.	K3
C213.4	Understand the principles of real-time operating systems.	K2
C213.5	Apply embedded systems programming, design, and development skills.	K3

Course Code & Title: C214 & 23EC405 Control Systems		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C214.1	Compute the transfer function of different physical systems.	K3
C214.2	Analyse the time domain specifications and calculate the steady state error.	K4
C214.3	Illustrate the frequency response characteristics of open loop and closed loop system response.	K4
C214.4	Analyse the stability using Routh-Hurwitz, root locus and state space methods.	K4
C214.5	Select suitable control system components for various applications.	K4

Course Code & Title: C215 & 23EC401 Artificial Intelligence and Machine Learning		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C215.1	Demonstrate the concepts of AI problems and use appropriate search algorithms for problem solving.	K3
C215.2	Apply reasoning under uncertainty and predicate logic methods for knowledge representation.	K3
C215.3	Implement supervised learning models for different Artificial Intelligence approaches to resolving a problem.	K3
C215.4	Demonstrate ensembling and unsupervised models to AI techniques in machine learning.	K3
C215.5	Illustrate the evaluation of the various algorithms and build deep learning neural network models.	K2

Course Code & Title: C216 & 23EC411 Linear Integrated Circuits Laboratory		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C216.1	Design basic op-amp circuits, integrator and differentiator.	K3
C216.2	Design filters and oscillators using op-amp.	K3
C216.3	Design D/A converter using op-amp.	K3
C216.4	Design multivibrators using IC555.	K3
C216.5	Simulate and analyze the performance of instrumentation amplifier, BPF, Wien bridge oscillator, Schmitt trigger and power supply circuits.	K3

Course Code & Title: C217 & 23EC412 Digital Signal Processing Laboratory		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C217.1	Carry out basic signal processing operations.	K3
C217.2	Demonstrate their abilities towards MATLAB-based implementation of various DSP systems.	K3
C217.3	Design and implement the FIR and IIR Filters using MATLAB for performing filtering operation over real-time signals.	K3
C217.4	Design and implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals.	K3
C217.5	Design a DSP system for various applications of DSP.	K3

Course Code & Title: C218 & 23ECA01 Embedded Systems with Arduino		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C218.1	Understand the fundamentals of embedded systems and the NodeMCU platform, including its features and applications.	K3
C218.2	Apply basic IoT concepts and perform input/output operations with NodeMCU, integrating sensors and devices.	K3
C218.3	Interface and read data from various sensors (e.g., DHT11, PIR, LDR) and display it through real-time monitoring.	K3
C287.4	Design no-code mobile applications for IoT control and successfully integrate them with cloud platforms for data storage and display.	K3
C218.5	Develop and implement an end-to-end IoT project combining NodeMCU, sensors, cloud connectivity, and mobile applications.	K3

SEMESTER 5

Course Code & Title: C301 & 23EC501 Networks and Security		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C301.1	Explain the Network Models, data link layers and Ethernet.	K2
C301.2	Categorize and classify the routing protocols.	K3
C301.3	List the functions of the transport and application layer.	K2
C301.4	Evaluate and choose the network security mechanisms and cryptography.	K4
C301.5	Apply the hardware security attacks and countermeasures.	K3

Course Code & Title: C302 & 23EC502 Communication Systems		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C302.1	Gain knowledge in various analog modulation techniques.	K2
C302.2	Understand the concepts of pulse modulation.	K2
C302.3	Gain knowledge in digital modulation techniques.	K2
C302.4	Apply the knowledge of noise characterization to obtain the various parameters of the communication systems.	K3
C302.5	Learn the basics of spread spectrum methods and multiple access techniques.	K2

Course Code & Title: C303 & 23EC503 Transmission Lines and RF Systems		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C303.1	Develop a transmission line model.	K2
C303.2	Analyze the performance of RF lines.	K4
C303.3	Analyze impedance matching by stubs using Smith Charts.	K4
C303.4	Characterize the wave propagation in parallel plates and waveguides.	K2
C303.5	Design a RF transceiver system for wireless communication.	K4

Course Code & Title: C304 & 23EC504 VLSI Design		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C304.1	Gain in depth knowledge of MOS technology.	K2
C304.2	Apply Combinational and Sequential logic circuits design principles.	K3
C304.3	Gain knowledge on memory architecture and arithmetic building blocks.	K2
C304.4	Apply the ASIC Design Process and Testing.	K3
C304.5	Develop digital circuits using Verilog and system Verilog programming.	K6

Course Code & Title: C305 & 23PEC12 Multimedia Compression and Communication		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C305.1	Apply suitable audio compression techniques.	K3
C305.2	Apply suitable image and video compression techniques.	K3
C305.3	Apply suitable text compression techniques.	K3
C305.4	Select suitable service model for specific application.	K3
C305.5	Explain the multimedia communication network.	K2

Course Code & Title: C306 & 23OME10 Mechatronics		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C306.1	Explain the role of Mechatronics and classify sensors based on applications.	K2
C306.2	Analyze the structure and functioning of the 8085 microprocessor.	K2
C306.3	Design and interface microprocessor systems using PPI (8255).	K2
C306.4	Develop basic PLC programs for industrial automation.	K2
C306.5	Apply Mechatronics design processes using actuators and practical case studies.	K2

Course Code & Title: C307 & 23EC511 Communication Systems Laboratory		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C307.1	Apply the principles of analog modulation and demodulation techniques such as AM and FM.	K3
C307.2	Implement sampling and Time Division Multiplexing (TDM) techniques in communication systems.	K4
C307.3	Investigate the signal transmission quality in communication systems.	K4
C307.4	Assess the performance of various digital modulation schemes including ASK, FSK, and PSK through simulation.	K4
C307.5	Design and simulate error control coding schemes using linear block and cyclic codes for reliable data communication.	K4

Course Code & Title: C308 & 23EC512 VLSI Design Laboratory		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C308.1	Write HDL code for basic as well as advanced digital integrated circuit.	K3
C308.2	Import the logic modules into FPGA Boards.	K3
C308.3	Synthesize Place and Route the digital IPs.	K4
C308.4	Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA tools.	K4
C308.5	Test and Verification of IC design.	K4

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Course Code & Title: C309 & 23EC601 IoT Architecture and Systems		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C309.1	Explain the fundamental structure, design components, and technologies that form an IoT system.	K2
C309.2	Describe the IoT reference architecture and interpret its functional, information, and deployment views.	K2
C309.3	Analyze IoT security challenges and apply suitable authentication, privacy, and data protection mechanisms.	K4
C309.4	Apply IoT communication protocols and analyze IoT data to derive meaningful insights.	K4
C309.5	Analyze IoT implementations in domains such as smart cities, grids, manufacturing, transportation, and healthcare.	K4

Course Code & Title: C310 & 23EC602 Antenna and Microwave Engineering		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C310.1	Apply the basic principles to obtain antenna parameters and link power budgets.	K3
C310.2	Design and assess the performance of various antennas.	K3
C310.3	Analyze the performance of uniformly and non-uniformly excited arrays.	K4
C310.4	Analyze the characteristics of microwave tubes and semiconductor devices.	K3
C310.5	Apply microwave system design principles to design microwave amplifiers and oscillators.	K4

Course Code & Title: C311 & 23EC603 Optical Communication and Networks		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C311.1	Explain the principles of optical fiber communication.	K2
C311.2	Analyze attenuation mechanisms in optical fibers.	K4
C311.3	Describe the working principles of optical sources and optical detectors.	K2
C311.4	Perform and interpret measurements related to fiber.	K3
C311.5	Explain optical network architectures, switching techniques and wavelength routing mechanisms	K2

Course Code & Title: C312 & 23PEC22 Medical Imaging Systems		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C312.1	Describe the working principle and applications of X-ray machines.	K2
C312.2	Explain the principles and procedures of computed tomography.	K2
C312.3	Interpret MRI techniques used for visualizing various body sections.	K3
C312.4	Demonstrate the applications of radionuclide imaging in medical diagnostics.	K3
C312.5	Assess different imaging techniques to select appropriate equipment for accurate diagnosis and implement radiation safety measures.	K4

Course Code & Title: C313 & 23PEC32 4G/5G Communication Networks		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C313.1	Understand the evolution of wireless networks.	K2
C313.2	Learn the concepts of 5G networks.	K2
C313.3	Analyse the 5G architecture and protocols.	K4
C313.4	Estimate the dynamic spectrum management.	K4
C313.5	Learn the security aspects in 5G networks.	K2

Course Code & Title: C314 & 23OCS03 Data Science Fundamentals		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C314.1	Apply core Python and data manipulation libraries to clean, preprocess, and transform data.	K3
C314.2	Analyze and visualize data using statistical and graphical methods to derive insights.	K4
C314.3	Apply machine learning models for classification, regression, and clustering tasks.	K3
C314.4	Handle large-scale datasets efficiently using distributed tools like PySpark and cloud platforms.	K3
C314.5	Present analytical findings through dashboards, reports, and interactive visualizations	K3

Course Code & Title: C315 & 23MC903 Disaster Risk Reduction and Management		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C315.1	Impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR).	K3
C315.2	Enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction.	K3
C315.3	Develop disaster response skills by adopting relevant tools and technology.	K3
C315.4	Enhance awareness of institutional processes for Disaster response in the country.	K2
C315.5	Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity.	K3

Course Code & Title: C316 & 23EC611 IoT Laboratory		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C316.1	Interface digital and analog components with embedded systems to construct basic input/output circuits.	K3
C316.2	Interface and control various electromechanical actuators including relays, DC motors, and servo motors.	K3
C316.3	Implement and analyze environmental sensing and measurement systems using moisture, ultrasonic, and light sensors.	K2
C316.4	Configure cloud platforms and implement HTTP-based data exchange for IoT applications.	K4
C316.5	Design and integrate multi-sensor systems to create functional security and automation applications.	K5

Course Code & Title: C317 & 23EC612 Optical and Microwave Laboratory		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C317.1	Analyze the characteristics of optical fiber.	K4
C317.2	Analyze the performance of fiber optic analog and digital link.	K4
C317.3	Analyze the radiation pattern of an antenna.	K4
C317.4	Analyze the characteristics of microwave components using S- parameters.	K4
C317.5	Analyze the attenuation characteristics of microwave transmission line.	K4

Course Code & Title: C318 & 23EC613 Mini Project		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C318.1	Apply theoretical knowledge gained from coursework to solve a practical engineering problem.	K3
C318.2	Design and implement a system, model, prototype, or software relevant to the chosen project.	K3
C318.3	Maintain proper project documentation, including reports and references.	K2
C318.4	Demonstrate professional ethics, originality, and adherence to academic standards.	K3
C318.5	Develop teamwork, documentation, presentation, and basic project management skills.	K3

Course Code & Title: C406 & 23EC711 Internship		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C406.1	Gain hands-on industrial exposure and understand real-world engineering practices.	K3
C406.2	Apply engineering concepts and tools in a professional work environment.	K3
C406.3	Understand organizational structure, work ethics, and professional responsibilities.	K2
C406.4	Improve technical, communication, and interpersonal skills through workplace interaction.	K3
C406.4	Develop awareness of industry challenges, emerging technologies, and career pathways.	K3

Course Code & Title: C407 & 23EC811 Project Work		
	CO Statements	Bloom's Taxonomy Level
The students should be able to		
C407.1	Identify and define a real-world problem and develop an appropriate technical solution.	K3
C407.2	Identify, analyze, and define a real-world problem and formulate appropriate technical solutions.	K4
C407.3	Design and develop a small-scale system, model, or application using relevant tools and technologies.	K4
C407.4	Enhance skills in literature survey, problem modeling, implementation, and testing.	K3
C407.5	Present and defend the project effectively through reports, presentations, and viva-voce, meeting evaluation criteria.	K3