



Program Outcomes

- 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, research literature, and analyse 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 modelling 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.



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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 Outcomes

2012 Pattern

F.E E&TC

101: Course Name: C107001-**Engineering Mathematics-I**

On the completion of the course, student will be able to

C101.1	Apply the knowledge of matrices in various engineering problems.
C101.2	Solve algebraic, transcendental equations and hyperbolic functions using complex numbers.
C101.3	Analyze infinite series and explain nth derivative of functions.
C101.4	Make Use of Taylor's &Maclaurian's series to expand infinitely differentiable functions and Solve examples of indeterminate forms.
C101.5	Explain and Apply Partial and Total derivatives in various engineering problems

102: Course Name: C107002 - **Engineering Physics**

On the completion of the course, student will be able to

C102.1	Define concepts in Engineering Physics.
C102.2	Explain concepts and applications of Optics, Acoustics, Solid State Physics, LASER, Quantum Mechanics, Superconductors and NanoParticles
C102.3	Derive formulae in Engineering Physics.
C102.4	Apply appropriate formulae to solve numericals in Engineering Physics.

103: Course Name: C102006 - **Engineering Graphics-I**

On the completion of the course, student will be able to

C103.1	Formulate solution to simple problems on projection of lines, planes, solids.
C103.2	Construct engineering curves such as ellipse, parabola, hyperbola, cycloid, involute, etc.
C103.3	Develop surfaces of solids.
C103.4	Create orthographic views from an isometric view.
C103.5	Create isometric view from orthographic views.



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104: Course Name: C103004 - **Basic Electrical Engineering**

On the completion of the course, student will be able to

C104.1	Define the fundamentals of resistance, work, power, energy and can convert energy in different forms.
C104.2	Make use of basic rules of electromagnetism to relate multidisciplinary machines.
C104.3	Apply concept of faradays law for demonstration of transformer working.
C104.4	Describe single phase AC circuit fundamentals.
C104.5	Solve polyphase circuits analytically and measure these result experimentally.
C104.6	Illustrate basic concept of dc circuits and network theorems.

105: Course Name: C101005 - **Basic Civil Environmental Engineering**

On the completion of the course, student will be able to

C105.1	Identify basic areas of civil engineering and role of civil engineer in the completion of infrastructure projects.
C105.2	Identify and Compare different construction material, automation in construction industry.
C105.3	Illustrate the basic principles and advancement in Survey.
C105.4	Describe the concept of ecology and environment, its preservation by waste management techniques
C105.5	Identify and classify the concept of eco-friendly materials, principles and bye-laws for integrated built environment.
C105.6	Identify and describe the sources of energy, environmental pollution to find an alternative solution.

106: Course Name: C110003 - **Fundamental Programming Language-I**

On the completion of the course, student will be able to

C106.1	Explain overview of open source operating system and types of Programming languages.
C106.2	Explain different program planning tools.
C106.3	Make Use of C programming constructs to solve different problems.

107: Course Name: C111007 - **Workshop Practices**

On the completion of the course, student will be able to

C107.1	Practice on manufacturing of components using workshop trades including fitting, carpentry, and welding
C107.2	Identify and apply suitable tools for machining processes including turning,



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	facing, thread cutting and tapping
C107.3	Describe manufacturing processes like forging, molding, Plumbing and machine tool operations including turning, facing, thread cutting, grinding etc.
C107.4	Comprehend the safety measures required to be taken while using the tools / Machines.

108: Course Name: C107008 - Engineering Mathematics-II

On the completion of the course, student will be able to

C108.1	Solve first order first degree differential equations for real world problem.
C108.2	Explain Fourier representation and solve definite integrals using advanced techniques.
C108.3	Analyze curve points and trace curve to find its arc length
C108.4	Apply solid geometry to find equations of sphere, cone and cylinder.
C108.5	Solve multiple integrals and to find different parameters.

109: Course Name: C107009 - **Engineering Chemistry**

On the completion of the course, student will be able to

C109.1	Describe technology involved in improving quality of water.
C109.2	Explain basic concept of electro analytical techniques that facilitate rapid and reliable measurements.
C109.3	Describe chemical structure, properties and applications of modern engineering materials
C109.4	Explain fossil fuel and derived fuels with its properties and applications
C109.5	Illustrate chemical and electrochemical corrosion and its prevention

110: Course Name: C102013 - **Basic Mechanical Engineering**

On the completion of the course, student will be able to

C110.1	Categorize various mechanical elements and power transmission devices.
C110.2	Describe design process, types of materials with their applications, types of mechanisms.
C110.3	Describe different manufacturing process with their applications.
C110.4	Illustrate working principle and operations of machining tools.
C110.5	Evaluate performance parameters of heat pump, heat engine and refrigerator.
C110.6	Categorize basic elements of power plant engineering.



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111: Course Name: C101011 - **Engineering Mechanics**

On the completion of the course, student will be able to

C111.1	Explain the characteristics of force, force systems and its application.
C111.2	Explain kinetics and kinematics.
C111.3	Explain and Describe work-energy and impulse momentum principle.
C111.4	Examine the equilibrium of structural members and concept of space force system.
C111.5	Calculate forces in different structural members, apply the laws of friction.

112: Course Name: C104012 - **Basic Electronics Engineering**

On the completion of the course, student will be able to

C112.1	Identify & Describe basic components used in Analog, digital & power electronics circuits.
C112.2	Explain the working and calculate basic parameters of electronic circuits and communication system.
C112.3	Explain basic principle of transducers and their applications.
C112.4	Implement basic electronic circuits.
C112.5	Improve written and oral skills related to Basic Electronics Engineering and engage in life-long learning.

113: Course Name: C110010 - **Fundamental Programming Language-II**

On the completion of the course, student will be able to

C113.1	Explain basic concepts of microprocessor and micro controller
C113.2	Make Use of basic concepts of C++, Java and Data structure.
C113.3	Explain programming concepts of embedded C.
C113.4	Explain concepts of Android operating system.

114: Course Name: C102014 - **Engineering Graphics-II**

On the completion of the course, student will be able to

C114.1	Formulate solution to simple problems on projection of solids through AUTOCAD
C114.2	Construct engineering curves using AUTOCAD
C114.3	Generate surfaces of solid using AUTOCAD
C114.4	Create orthographic views from an isometric view using AUTOCAD
C114.5	Create isometric view from orthographic views using AUTOCAD



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S.E E&TC

201: Course Name: C204181-Signals & Systems

On the completion of the course, student will be able to

C201.1	Describe and analyze the properties of Continuous Time (CT) and Discrete Time (DT) signals and systems.
C201.2	Develop input output relationship for linear shift invariant system using convolution.
C201.3	Describe and analyze signals in the Time & Transform domain.
C201.4	Perform Statistical analysis of signals using probability theory
C201.5	Improve written, oral, and presentation skills related to Signals and Systems and engage in life-long learning.

202: Course Name: C204182-Electronics Devices and Circuits

On the completion of the course, student will be able to

C202.1	Explain fundamental concepts of JFET and MOSFET.
C202.2	Design, build and test MOSFET circuits in AC and DC analysis and describe various applications of MOFET.
C202.3	Evaluate the performance of FETs in feedback amplifiers and oscillators.
C202.4	Explain and Design adjustable voltage regulators.
C202.5	Improve written, oral, & presentation skills related to Electronics Devices and Circuits and engage in lifelong learning.

203: Course Name: C204183-Network Theory

On the completion of the course, student will be able to

C203.1	Analyze basic AC & DC circuit for voltage, current and power by using KVL, KCL, and network theorems.
C203.2	Apply graph theory to solve network equations.
C203.3	Identify and analyze the various resonance circuits and carry out transient analysis.
C203.4	Analyze and design filters and attenuators.
C203.5	Analyze and formulate transfer function using all network parameters.

204: Course Name: C204184-Data Structures and Algorithms

On the completion of the course, student will be able to

C204.1	Explain and Implement basic programs using array and pointers
C204.2	Discuss the computational efficiency of the principle algorithms such as sorting & searching
C204.3	Describe and Compare linked lists and their applications
C204.4	Implement and Compare stack & queue for applications
C204.5	Explain various terminologies and traversals of trees and use them for



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	Applications
C204.6	Explain various terminologies and traversals of graphs and use them for Applications

205: Course Name: C204185-**Digital Electronics**

On the completion of the course, student will be able to

C205.1	Demonstrate the basic logic gates and various variable reduction techniques of digital logic circuit
C205.2	Design and compare combinational circuit and Sequential Circuit
C205.3	Simulate and verify using simulation software to obtain desired circuit
C205.4	Explain and verify circuit model with hardware implementation
C205.5	Improve written, oral and presentation skills related to Digital Electronics and engage in life-long learning.

206: Course Name: C204186-**Electronics Measuring Instruments and Tools**

On the completion of the course, student will be able to

C206.1	Explain various parameter of measuring instrument.
C206.2	Describe specifications, features and capabilities of electronic instruments.
C206.3	Carry out required measurement using various instruments under different setups.
C206.4	Compare performance parameters and select an appropriate instrument for given measurement
C206.5	Improve written, oral and presentation skills related to Electronics measuring Instruments and Tools and engage in life-long learning.

207: Course Name: C207005-**Engineering Mathematics – III**

On the completion of the course, student will be able to

C207.1	Solve higher order linear Differential equations and model L-C-R electrical circuits
C207.2	Evaluate Fourier Transform, Inverse Fourier Transform, Z-transform, Inverse Z-transform and solution of difference equation by Z-transform.
C207.3	Apply interpolation techniques, evaluate numerical differentiation, integration and solve first order differential equations using Eulers, Modified Eulers and Runge-Kutta 2 nd and 4 th order method
C207.4	Apply vector differential operators Gradient, Divergence, Curl to deal with Directional Derivatives, Vector Identities, Scalar Potential, Solenoidal, Irrotational and Conservative Fields
C207.5	Apply Greens, Gauss divergence, Stokes theorem to evaluate Line integral, Surface integral, volume integrals and solve problems in Electromagnetic fields.
C207.6	evaluate analytic functions using Cauchy Riemann Theorem, evaluate bilinear transformation and apply Cauchy's integral theorem, residue theorem to evaluate



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line integrals in the complex plane

208: Course Name: C204187-**Integrated Circuits**

On the completion of the course, student will be able to

C208.1	Explain internal structure, characteristics and Manufacturing techniques of Op-Amp.
C208.2	Describe various performance parameters, frequency and transient response and frequency compensation of Op-amp.
C208.3	Identify and Analyze linear, nonlinear applications of Op-Amp.
C208.4	Analyze converters using Op-amp and some special purpose IC's like PLL.
C208.5	Implement a hardwired circuit using Op-amp to test performance of circuit.
C208.6	Improve written, oral, and presentation skills related to Integrated Circuits.

209: Course Name: C204188 - **Control Systems**

On the completion of the course, student will be able to

C209.1	Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems.
C209.2	Explain the relationship between control system parameters and transient behavior
C209.3	Determine the frequency response to evaluate the system stability using graphical and analytical methods
C209.4	Explain analog and digital controllers. Model and analyze the control systems using state space analysis
C209.5	Improve written, oral and presentation skills related to Control Systems and engage in life-long learning.

210: Course Name: C204189–**Analog Communication**

On the completion of the course, student will be able to

C210.1	Describe, analyse and compare fundamental concepts, various components and modulation schemes of analog Communication systems
C210.2	Describe demodulation techniques and the performance of analog communication receivers
C210.3	Explain and compare different types of noise and performance of communication systems under the presence of noise
C210.4	Develop the ability to compare and contrast the strengths and weaknesses of analog communication systems to describe various pulse and digital modulation techniques
C210.5	Improve written, oral, and presentation skills related to Analog communication and engage in life-long learning
C210.6	Develop project related to fundamental concepts in Analog Communication



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211: Course Name: C204190–Computer Organization

On the completion of the course, student will be able to

C211.1	Explain Pipelining, Superscalar operation in a computer, and be able to contrast CISC versus RISC machines, multiprocessor versus multicomputer.
C211.2	Apply different algorithms for multiplication of signed operands, division of integer operands, and be able to represent real numbers in Floating point IEEE formats.
C211.3	Describe the execution of complete instruction in a single bus CPU or Multi-bus CPU and be able to explain Hardwired control Unit and Micro-programmed Control Unit.
C211.4	Apply Direct Memory Access and the use of interrupts in I/O organization.
C211.5	Create different sized memories and explain Virtual Memory.
C211.6	Demonstrate the 8086 Microprocessor, addressing modes and interrupt structure of 8086.

212: Course Name: C204191–Object Oriented Programming

On the completion of the course, student will be able to

C212.1	Explain object-oriented design and describe the concepts of encapsulation, abstraction, inheritance, and polymorphism.
C212.2	Develop basic programs in an object-oriented programming language
C212.3	Design and Implement relationships among objects using a class hierarchy and inheritance.
C212.4	Compare the notions of overloading and overriding methods in an object-oriented language.
C212.5	Improve written, oral, and presentation skills related to OOP and engage in life-long learning.

213: Course Name: C204192 – Soft Skills

On the completion of the course, student will be able to

C213.1	Communicate, interact and present his ideas to the other professionals.
C213.2	Understand importance, role and contents of soft skills through instructions, knowledge acquisition, demonstration and practice
C213.3	Have right attitudinal and behavioral aspects, and build the same through activities.
C213.4	Possess right professional and social ethical values



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T.E E&TC

301: Course Name: C304181–Digital Communication

On the completion of the course, student will be able to

C301.1	Explain object-oriented design and describe the concepts of encapsulation, abstraction, inheritance, and polymorphism.
C301.2	Develop basic programs in an object-oriented programming language
C301.3	Design and Implement relationships among objects using a class hierarchy and inheritance.
C301.4	Compare the notions of overloading and overriding methods in an object-oriented language.
C301.5	Improve written, oral, and presentation skills related to OOP and engage in life-long learning.

302: Course Name: C304182–Digital Signal Processing

On the completion of the course, student will be able to

C302.1	Use different transforms for the analysis of discrete time signals and systems.
C302.2	Compare, Design and realizedigital filters.
C302.3	Explain the sampling theorem and use it for the design of multistage sampling rate converter.
C302.4	Describe thearchitecture of DSP processor and Explain different applications of signal processing.
C302.5	Improve written, oral, and presentation skills related to Digital Signal Processing and engage in life-long learning.

303: Course Name: C304183–Microcontroller & Applications

On the completion of the course, student will be able to

C303.1	Describe the importance of microcontroller in designing embedded application
C303.2	Explain the architecture and features of typical Microcontroller
C303.3	Use of hardware and software tools
C303.4	Develop interfacing to real world devices
C303.5	Improve written, oral, and presentation skills related to Microcontroller and Applications and engage in life-long learning



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304: Course Name: C304184–Electromagnetics and Transmission Lines

On the completion of the course, student will be able to

C304.1	Explain the fundamentals of static and time varying electromagnetic fields identify the electromagnetic problems and distinguish the different fields.
C304.2	Solve the electromagnetic problems with the use of Maxwell's equations.
C304.3	Apply the knowledge of electromagnetics to derive uniform plane wave equation
C304.4	Analyze the transmission line problem; use the Smith chart to calculate impedances.
C304.5	Improve written, oral, and presentation skills related to the field of Electromagnetics and Transmission Lines and engage in life-long learning.

305: Course Name: C304185–System Programming and Operating System

On the completion of the course, student will be able to

C305.1	Explain the fundamental knowledge of language processing activities and designing of Assembler.
C305.2	Develop comprehensive skills to design Macro Processor, Compiler, Interpreter, Linker, and Loader.
C305.3	Compare and analyze the different implementation approaches of Operating System abstractions.
C305.4	Interpret various OS functions used in Linux (Ubuntu) and Windows for memory management, Input/output and file system.
C305.5	Improve written, oral, and presentation skills related to System Programming and Operating System and engage in life-long learning.

306: Course Name: C304188–Employability Skills in Electronics Design

On the completion of the course, student will be able to

C306.1	Explain and interpret the specifications
C306.2	Analyze different modules and select optimal design topologies
C306.3	Interpret datasheets and thus select appropriate components and devices to build the circuit schematic.
C306.4	Use an EDA tool for circuit schematic and validate its performance by simulating the same
C306.5	Improve written, oral, and presentation skills related to Electronics Design.
C306.6	Extend overall responsibility with respect to creating and simulating with new ideas in the field of Electronics Design engage in life-long learning



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307: Course Name: C304189– Information Theory & Coding Techniques

On the completion of the course, student will be able to

C307.1	Describe the fundamental concepts of information theory and source coding techniques.
C307.2	Explain fundamentals of channel coding.
C307.3	Analyze channel coding techniques and evaluate its error performance.
C307.4	Explain TCM and design characteristics of digital communication system.
C307.5	Improve written, oral & presentation skills related to Information Theory and Coding Techniques & engage in lifelong learning.

308: Course Name: C304190 – Antenna and Wave Propagation

On the completion of the course, student will be able to

C308.1	Formulate the wave equation and solve it for uniform plane wave.
C308.2	Analyse various performance parameters of different antennas.
C308.3	Identify the suitable antenna for a given communication system.
C308.4	Design different linear and nonlinear arrays.
C308.5	Improve written, oral, and presentation skills related to Antenna and Wave Propagation.

309: Course Name: C304191 – Embedded Processors

On the completion of the course, student will be able to

C309.1	Explain the ARM and ARM Cortex microprocessor architectures and its feature.
C309.2	Compare different series of ARM microprocessor and Select appropriate processor while developing the embedded system.
C309.3	Interface the advanced peripherals to ARM based microcontroller.
C309.4	Interface the advanced peripherals to ARM Cortex M3 based microcontroller.
C309.5	Improve written, oral and presentation skills related to embedded system and engage in life-long learning.

310: Course Name: C304192 – Industrial Management

On the completion of the course, student will be able to

C310.1	Describe Basics of Management with different management functions.
C310.2	Identify different phases of quality and study various tools for quality analysis
C310.3	Explain Structure of finance market and analyze cost-benefit situations
C310.4	Explain Human Resource Management as one of the major tools in industry
C310.5	Elaborate project management with Project Network and Justify the Importance and need of Entrepreneurship
C310.6	Explain Management Information Systems



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311: Course Name: C304193– **Power Electronics**

On the completion of the course, student will be able to

C311.1	Describe different power devices, their construction, characteristics and triggering circuits
C311.2	Describe working of AC voltage controllers, resonant converters & analyze controlled rectifiers, inverters, DC choppers, for different loads.
C311.3	Describe the different motor drives & various power electronics applications like UPS, SMPS, etc.
C311.4	Describe working of different protection circuits & EMI minimizing techniques.
C311.5	Improve written, oral & presentation skills related to Power Electronics & engage in lifelong learning.

312: Course Name: C304196 – **Mini Project & Seminar**

On the completion of the course, student will be able to

C312.1	Plan and execute a Mini Project with team.
C312.2	Implement electronic hardware by learning PCB artwork design, soldering techniques, trouble shooting and necessary software tools etc.
C312.3	Improve written, oral, and presentation skills related to Mini project and seminar and engage in life-long learning
C312.4	Extend the overall responsibility with respect to creating, simulating and experimenting with new ideas in the field of Mini project and seminar.

B.E E&TC

401: Course Name: C404181 – **VLSI Design and Technology**

On the completion of the course, student will be able to

C401.1	Construct the fundamental blocks of a VLSI circuits, simulate, synthesis and prototype in PLDs.
C401.2	Analyze the influence of wires/interconnects on VLSI circuit Performance.
C401.3	Design analog & digital CMOS circuits for specified applications.
C401.4	Evaluate chip level issues and need of testability.
C401.5	Improve written, oral, and presentation skills related to VLSI design and Technology and engage in life-long learning.

402: Course Name: C404182 – **Computer Networks**

On the completion of the course, student will be able to

C402.1	Describe and compare OSI and TCP/IP model.
C402.2	Explain duties of various layers and analyze different protocols involved in computer networking.
C402.3	Describe various wireless LAN technologies and virtual LANSs.
C402.4	Analyze the requirements for a given organizational structure and select the appropriate networking architecture.



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C402.5	Identify the importance of cryptography and network security.
C402.6	Improve written, oral, and presentation skills related to Computer Networks and engage in life-long learning.

403: Course Name: C404183 – **Microwave Engineering**

On the completion of the course, student will be able to

C403.1	Describe the Mechanism of energy propagation in a waveguide.
C403.2	Analyze the working of passive microwave components.
C403.3	Describe & Compare the principles of working of Microwave tubes and Devices for generating microwaves.
C403.4	Select & Demonstrate techniques used in a typical Microwave measurement system.
C403.5	Improve written, oral, and presentation skills related to Microwave Engineering and engage in life-long learning.

404A: Course Name: C404184 – Elective – I - **Digital Image Processing**

On the completion of the course, student will be able to

C404A.1	Describe the fundamentals of DIP from human visual perception to image formation model.
C404A.2	Demonstrate fundamental concepts of low level image Processing.
C404A.3	Explain the different segmentation and pattern recognition Algorithm.
C404A.4	Describe various applications of image processing.
C404A.5	Improve written, oral, and presentation skills related to DIP and engage in life-long learning.

404B: Course Name: C404184 – Elective – I - **Embedded Systems & RTOS**

On the completion of the course, student will be able to

C404B.1	Explain the concepts and design metrics of Embedded System.
C404B.2	Use the concepts of real time operating system and Implement it using MicroC/OS-II RTOS and ARM7.
C404B.3	Illustrate the basic knowledge of Linux operating system and device drivers using embedded system platform and ARM9.
C404B.4	Describe the H/W-S/W co-design issues and testing methodology for embedded system to design real time applications.
C404B.5	Improve written, oral, and presentation skills related to Embedded system and RTOS and engage in life-long learning.

405A: Course Name: C404185 – Elective – II - **Electronic Product Design**

On the completion of the course, student will be able to

C405A.1	Describe the product design from designer and user point of view
C405A.2	Explain the stages involved in hardware and software designing for system development
C405A.3	Describe different testing methods and debugging processes for system.
C405A.4	Explain importance and processes of documentation



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C405A.5	Improve written, oral, and presentationskills related to Electronic productdesign and engage in life-long learning.
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405B: Course Name: C404185 – Elective – II - **PLC &Automation**

On the completion of the course, student will be able to

C405B.1	Explain fundamentals of process control & Automation
C405B.2	Design signal conditioning circuit and Explain various types of Transmitter.
C405B.3	Design automation system using PLC Ladder program and Select finalcontrol elements for real time system
C405B.4	Explain Architecture of SCADA, DCS, PLC, HMI, CNC Machine.
C405B.5	Improve written, oral, & presentation communication skills in PLC &Automation and engage in learning beyond the syllabus.

405C: Course Name: C404185 – Elective – II – **Artificial Intelligence**

On the completion of the course, student will be able to

C405C.1	Explain the various types of environment & working of Intelligent agents
C405C.2	Analyse the searching problem with search algorithms, search strategies &optimal decision making.
C405C.3	Represent the knowledge syntax & semantics related to solution searchingwithin problem environment and artificial systems.
C405C.4	Explain the learning methodologies of neural network with and withoutrelevant data base(knowledge environment).
C405C.5	Design & Describe the algorithm used for intelligent expert systems.
C405C.6	Improve written, oral, and presentation communication skills related to the subject of Artificial Intelligent Systems and engage in a life-long learning.

406: Course Name: C404188 – Project Phase-I

C406.1	Undertake an innovative application based Project idea in a diversified field.
C406.2	Conduct Survey andcomparative study related to project idea.
C406.3	Estimate budget, design Hardware & Software and prepare project plan.
C406.4	Analyze and simulate project work.
C406.5	Develop projectswith emerging technologies by adapting different circumstances considering ethical and social responsibilities.
C406.6	Improve written, oral, and presentation skills related to Project Phase I and engage in life-long learning.

407: Course Name: C404189 – Mobile Communication

On the completion of the course, student will be able to



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C407.1	Explain and apply the concepts of telecommunication switching, signaling, traffic and networks
C407.2	Analyze the telecommunication traffic.
C407.3	Analyze radio channel and cellular capacity.
C407.4	Explain and apply concepts of GSM and CDMA system.
C407.5	Improve written, oral, and presentation skills related to Mobile communication and engage in life-long learning.

408: Course Name: C404190 – **Broadband Communication Systems**

On the completion of the course, student will be able to

C408.1	Analyze the principle of Modal propagation of light through an Optical Fibre and Explain working principles of the key components of a typical Fibre Optic Communication system.
C408.2	Estimate Power and Rise Time Budgets for a typical fibre optic link.
C408.3	Explain the basic working principle of WDM and its components and Optical Amplifiers.
C408.4	Describe Key components, various satellite subsystems and Orbital effects in Satellite Communication Systems.
C408.5	Estimate satellite link budget for up-link, down-link, and overall link and Analyse orbital mechanics, calculation of antenna look angles, C/N and G/T computations.
C408.6	Improve written, oral, and presentation communication skills related to Broadband Communication Systems and engage in a life-long learning.

409A: Course Name: C404191 – Elective – III - **Audio Video Engineering**

On the completion of the course, student will be able to

C409A.1	Analyze Composite video signal, TV pictures, TV transmitters and Receivers, Identify various faults in TV systems using various Fault finding meters
C409A.2	Study various color TV systems with greater emphasis on TV standards
C409A.3	Explain working principles and standards of DTV, HDTV, advanced TV systems along with different video, audio compression techniques and advanced display devices
C409A.4	Describe audio recording techniques like CD/ DVD recording, audio standards and acoustic principles
C409A.5	Improve written, oral, and presentation skills related to Audio Video Engineering and engage in life-long learning.

409B: Course Name: C404191 – Elective – III – **Soft Computing**

On the completion of the course, student will be able to

C409B.1	Use a new tool /tools to solve a wide variety of real world problems
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C409B.2	Find an alternate solution , which may offer more adaptability, resilience and optimization
C409B.3	Identify the suitable antenna for a given communication system
C409B.4	Gain knowledge of soft computing domain which opens up a whole new career option
C409B.5	Tackle real world research problems

410A: Course Name: C404192 – Elective – IV - **Wireless Networks**

On the completion of the course, student will be able to

C410A.1	Explain the architecture and features of wireless networks.
C410A.2	Compare various protocols and services provided by wireless technologies
C410A.3	Describe the transmission of voice and data through various networks.
C410A.4	Explain the latest wireless technologies and trends in communication field.
C410A.5	Improve written, oral, and presentation skills related to Wireless Networks and engage in life-long learning.

410B: Course Name: C404192 – Elective – IV –**Biomedical Signal Processing**

On the completion of the course, student will be able to

C410B.1	Model a biomedical system.
C410B.2	Explain various methods of acquiring bio signals.
C410B.3	Explain various sources of bio signals distortions and its remedial techniques.
C410B.4	Analyze ECG and EEG signal with characteristics feature points.
C410B.5	Analyze and apply filters in biomedical field.

411: Course Name: C404195 – **Project Phase-II**

C411.1	Undertake an innovative application based Project idea in a diversified field.
C411.2	Survey, Analyze, Estimate Budget and prepare project plan.
C411.3	Design and implement project work.
C411.4	Troubleshoot and debug the project.
C411.5	Develop projects with emerging technologies, adapt to new situations in various fields by considering ethical and social responsibilities
C411.6	Improve written, oral, and presentation skills related to Project Phase II and engage in life-long learning.