

## **BE- Electronics & Communication Engineering**

### **Program Outcomes (POs):**

Program outcomes are narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge and behaviors that students acquire in their matriculation through the program.

**PO 1: Engineering knowledge:** Apply the knowledge of mathematics, science, and engineering & technology fundamentals, applying to the engineering specialization. To create new products and processes applying engineering knowledge.

**PO 2: Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. Identifying symptoms of the problem, the overriding problem establishing the root causes and effects related to that problem, are identified and subsequently addressed in the project design. Learner must be able to identify problems, analysing them- root & cause effect, data and information gathering, generating ideas towards solution, evaluating the ideas for feasibility, understand all stakeholders and users' needs, scope of problem, solution boundary and constraints imposed to achieve solution with countermeasure plan.

**PO 3: Design and 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. Possess exceptional design abilities to come up with new solutions and create highly effective products. Design abilities include creating technical drawings, product plans, protocols and guidelines.

**PO 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. Series of observations and informed decisions used to find and implement a solution to the problem. Beyond finding and implementing a chosen most optimal solution. Complex problem solving also involves considering future changes to circumstance, resources and capabilities that may affect the trajectory of the product or process and success of the solution, considering the impact of the

solution on the surrounding environment and individuals. It includes the method of measuring solution success.

**PO 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. Also ICT tools knowledge to enable engineers to enhance their design and simulation capabilities, with more efficient and accurate planning and analysis. To facilitate platforms for sharing and accessing project data and information, to automate leading to increased productivity, cost savings, and improved decision-making.

**PO 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. Engineers need to understand in the context of their role in society, and engineer must be understood in the context of work done within society.

**PO 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. Promote saving energy, use of sustainable items among learners, making learners aware about reduce, reuse, recycle.

**PO 8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. To recognize ethical and professional responsibilities in engineering states & situations to make informed judgments, leading to engineering solutions in global, economic, environmental, and societal contexts.

**PO 9: Individual and team work:** To transform a group into an effective, cohesive and collaborative unit. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. Enable learns to understand the stages of team development- Forming stage, Storming stage, Norming stage, Performing stage, and Adjourning stage. To set team norms set a standard for behaviour, attitude, and performance that all the learning group team members are expected to follow.

**PO 10: Soft skills & Communication:** Able to communicate with others. 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. To communicate effectively with a range of audiences. Other soft skills that include Empathy, Adaptability, Creative thinking, Dependability, Critical Thinking, Creative thinking, Conflict resolution, Negotiation, Time management must be practised.

**PO 11: Project development, management and finance:** Demonstrate knowledge and understanding of the engineering development 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. To impart the development of the product or process as well as controlling the parameters like planning, human resource, budget, scope, risk, quality and schedule or time period from managerial perspective also. Promote industry academia project development that involves collaboration between industry and academia to undertake engineering development projects that aim to address real-world challenges and create innovative solutions for the society, making learner industry and job fit.

**PO 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. To incubate the culture of lifelong learning that is, self-initiated education focused on personal development. As natural learners to inculcate natural drive to explore natural curiosity, learn and grow and encourage us improve quality of life and sense of self-worth by paying attention to the contemporary ideas and goals. Encourage learners to self-learn giving rise to Renewed self-motivation, Recognition of personal interests and goals, Improvement in other personal and professional skills, Improved self-confidence, Stronger soft skills, Better cognitive health, Confidence, Networking opportunities.

**PO 13: Industry and corporate skills:** To align the curriculum to the job market. A graduate must be able to capable of performing as an engineer in the field of the company for which you are applying. Student must have skills that are most relevant to contemporary engineering industry domain. The student must be skilled to abridge the industry academia gap while studying. To develop proper corporate working environment in education. Curriculum must be aligned as per the industry standards, To facilitate industrial exposure to

faculties. To fulfil skill gap or performance gap or employability gap. Pursue academia and Industry to form strong relationships with one another and serve the needs of society at large.

**PO 14: Entrepreneurship & Startuppreneurship:** Practice process of planning, starting and operating a business venture. Making learners to get educated from the knowledge & skills perspectives, awareness and culture for entrepreneurship. This includes - training & education, business mentoring & coaching, financing (debt or equity), networking initiatives, framework conditions and policies. Inculcate startuppreneurship to create and launch innovative products or services, Building a sustainable business model for long-term success.

**Program Specific Outcomes (POs):**

**PSO1:** Demonstrate comprehensive knowledge and practical skills in the subareas of circuit design and analysis, IC design, VLSI, communications, signal processing, IoT, robotics and apply this knowledge to solve advanced problems.

**PSO2:** Demonstrate the competence to translate abstract algorithms in communications, signal processing, computing and sensing to real-time circuits & systems and analyze their performance.

**PSO3:** Apply the knowledge and skills to design and develop state-of-the-art hardware and software systems as well as products.

**PSO4:** Demonstrate knowledge and skills at sufficient depth and breadth to excel in research programs and interdisciplinary areas.

**Semester-I**

<b>Course Code/ Name</b>	<b>Course Outcomes</b>
MA110T Mathematics-I	<ul style="list-style-type: none"> <li>• Understand the fundamentals of the mathematics to apply while designing technology and creating innovations</li> <li>• Compute limits and derivatives of functions of two and three variables, develops skill of higher derivative, expansion of functions in ascending power of variable &amp; value of the function in neighborhood of some points.</li> <li>• Analyze multidimensional functions to find derivatives, tangent lines to level curves, and to solve optimization problems using extreme value of a given function related to engineering application</li> <li>• Find integrals, arc length, double and triple integrals for finding area, volume, centre of mass and various other engineering applications</li> <li>• Compute and simplify expressions involving beta and gamma function. Apply the beta and gamma functions to solve problems in calculus.</li> <li>• Develops the ability to understand basics of geometry, find radius of curvature &amp; torsion of given curve which is helpful to trace the curve for a</li> </ul>

	given equation of a curve & its nature.
PH110T Physics	<ul style="list-style-type: none"> <li>• Develop a comprehensive understanding of optical interference phenomena, including Fresnel's biprism, thin film interference, and Newton Ring Experiment.</li> <li>• Apply the principles of interference and diffraction to analyze and solve problems related to optics.</li> <li>• Understand the fundamental concepts of quantum mechanics, including particle velocity, the uncertainty principle, and Compton scattering.</li> <li>• Develop an understanding of nuclear composition, mass defect, binding energy, and nuclear force, and explore applications such as linear particle accelerators and Geiger-Muller counters.</li> <li>• Analyze the characteristics of P-N junctions, mobility, carrier concentrations, and the Hall effect in semiconductors.</li> <li>• Understand the principles of lasers, including stimulated and spontaneous processes, Einstein's A and B coefficients, and population inversion working principles of specific lasers.</li> <li>• Understand the advantages and applications of optical fibers in communication systems.</li> </ul>
PH110P Physics	<ul style="list-style-type: none"> <li>• Analyze the voltage-current (V-I) characteristics of a PN diode, Zener diode and an LED diode</li> <li>• Understand the factors influencing the efficiency of solar cells and their applications.</li> <li>• Develop skills in drawing the V-I characteristics curve of an NPN transistor, PNP transistor in Common Emitter (CE) mode and Common Base (CB) mode.</li> <li>• Understand the principles of diffraction, interference phenomenon and polarimetry.</li> <li>• Determine the approximate value of the energy band gap of the diode.</li> <li>• Understand the applications of G-M counters in radiation detection.</li> </ul>
HU110T English	<ul style="list-style-type: none"> <li>• Identify and differentiate between the various parts of speech, including nouns, verbs, adjectives, adverbs, pronouns, prepositions, conjunctions, and interjections.</li> <li>• Use verb tenses (present, past, future, perfect, progressive, etc.) correctly and consistently.</li> <li>• Convert direct speech (quoting) to indirect speech (reported speech) and vice versa.</li> <li>• Demonstrate the ability to understand and analyze a variety of written texts, including literature, non-fiction, and academic articles.</li> <li>• Develop effective writing skills by composing coherent and well-structured essays, reports, and other written assignments.</li> <li>• Understand and use advanced vocabulary in context.</li> </ul>
HU110P English	<ul style="list-style-type: none"> <li>• Expand and enrich vocabulary through reading and writing.</li> <li>• Deliver oral presentations with clarity and confidence.</li> <li>• Engage in effective verbal communication in both formal and informal settings.</li> <li>• Participate in class discussions, debates, and group activities.</li> </ul>

	<ul style="list-style-type: none"> <li>• Demonstrate effective listening skills when engaging in discussions and presentations.</li> </ul>
CE110T Engineering Mechanics	<ul style="list-style-type: none"> <li>• Apply the fundamental laws of statics to analyze and solve problems related to the equilibrium of forces.</li> <li>• Apply the principles of resolution and composition of forces to solve practical engineering problems.</li> <li>• Create free body diagrams to represent and analyze forces acting on objects.</li> <li>• Determine resultant and equilibrant forces using various laws and theorems.</li> <li>• Analyze equilibrium in bodies subjected to two, three, or more than three forces.</li> <li>• Analyze coplanar non-concurrent forces and their effects.</li> </ul>
CE110P Engineering Mechanics	<ul style="list-style-type: none"> <li>• Creates free body diagrams and solve real world engineering problems.</li> <li>• Measure and analyze moments of forces in actual systems.</li> <li>• Determine support reactions for real-world structures.</li> <li>• Apply practical truss analysis techniques to real structures.</li> <li>• Measure area moment of inertia for various shapes and objects.</li> </ul>
ME111T Engineering Graphics	<ul style="list-style-type: none"> <li>• Learn more about the essential engineering drawing tools. This will give student basic knowledge of technical drawings professions and means of communications to others.</li> <li>• Learning the necessary drawing skills, which are necessary for engineers, such as lines, angles, and shapes.</li> <li>• Recognize the fundamentals of utilizing dimensions in engineering drawings and clarify the concepts of projection and sectioning.</li> <li>• Become familiar with the various drawing tools, technical requirements, and assembly techniques for geometric shapes. Students will be able to sketch realistic drawings and three-dimensional objects on paper as a result.</li> <li>• Recognize how the body's surface develops, identify intersections, and learn the essential concept from assembly and detail drawings.</li> </ul>
ME111P Engineering Graphics	<ul style="list-style-type: none"> <li>• Developing basic drawing skills, which are necessary for engineers, such as lines, angles, and shapes.</li> <li>• Develop student's imagination and ability to represent the shape size and specifications of physical objects.</li> <li>• Use the details to identify engineering objects.</li> <li>• Understand the specifics of orthographic and isometric 3D projections.</li> <li>• Developing the ability to sketch forms, lines, angles, and other things is important for engineers.</li> <li>• .</li> </ul>
ML110P Environmental Sciences*	<ul style="list-style-type: none"> <li>• Develop critical thinking skills in relation to environmental affairs</li> <li>• Acquire knowledge about natural resources and their effective management</li> <li>• Expand awareness of self in a global society and effectively engage diverse perspectives, values, and cultures, ranging from local to global, in dealing with environmental and social issues</li> <li>• Interpret and propose solutions to various environmental pollution</li> <li>• Formulate an action plan for sustainable alternatives that integrate</li> </ul>

	<p>science, humanist, and social perspectives</p> <ul style="list-style-type: none"> <li>Analyze the major environmental laws in India, including the Water act, the Air act, the Environmental protection act, and their enforcement.</li> </ul>
EC111T Introduction to Electronics Engineering*	<ul style="list-style-type: none"> <li>Able to understand the type of semiconductor.</li> <li>Able to understand the working of diode.</li> <li>To understand the basics of number system &amp; how different operation perform on them.</li> <li>Able to understand the Boolean algebra &amp; logic Gate.</li> <li>Able to understand the different types of signal in communication system.</li> <li>Able to understand the basic of communication system.</li> </ul>
EC111P Introduction to Electronics Engineering*	<ul style="list-style-type: none"> <li>Understand how to operate the CRO.</li> <li>Calculated the VI –characteristics of different types of diode.</li> <li>Perform different Boolean logic.</li> <li>Understand the working of rectifier.</li> </ul>
HU111P Communication*	<ul style="list-style-type: none"> <li>Develop how to write book review.</li> <li>Develop clear and concise written communication skills for various purposes such as emails, reports, and essays.</li> <li>Express ideas and information clearly and confidently through spoken language.</li> <li>Develop active listening skills to understand and respond effectively to others.</li> <li>Resolve conflicts and communicate assertively in personal and professional contexts.</li> </ul>

## Semester-II

<b>Course Code/ Name</b>	<b>Course Outcomes</b>
MA111T Mathematics – II	<ul style="list-style-type: none"> <li>Apply the fundamental concepts of Ordinary Differential Equations and Partial Differential Equations and the basic numerical methods for their resolution.</li> <li>Developing the skills to solve higher-order homogeneous linear differential equation through characteristic equations and finding the general solution.</li> <li>Understand the difficulty of solving problems analytically and the need to use numerical approximations for their resolution.</li> <li>Use computational tools to solve problems and applications of Ordinary Differential Equations and Partial Differential Equations.</li> <li>Formulate and solve differential equation problems in the field of Industrial Organization Engineering.</li> <li>Developing problem solving skill in graph theory ,including finding paths cycles and connectivity.</li> </ul>
CY110T Chemistry	<ul style="list-style-type: none"> <li>Analyze molecular structures and bonding theories using the VSEPR model, Valence-Bond Theory, and Molecular Orbital Theory</li> <li>Differentiate hard and soft water, solve the related numerical problems on</li> </ul>

	<p>water purification and its significance in industry and daily life.</p> <ul style="list-style-type: none"> <li>• Understand the causes of corrosion, its consequences and methods to minimize corrosion to improve industrial designs.</li> <li>• Understand the principles of electrochemistry, including the Arrhenius theory, transport numbers, and solubility products, and apply them to redox reactions and electrochemical cells.</li> <li>• Equipped with basic knowledge of polymer reinforced composites, applications of semiconductor photochemistry in energy harnessing and optical sensors.</li> <li>• Understand the fundamental concepts of thermochemistry, including the first law of thermodynamics, work, heat, energy, and enthalpies, and their applications.</li> </ul>
CY110P Chemistry	<ul style="list-style-type: none"> <li>• Enhance the thinking capabilities in the modern trends in Engineering &amp; Technology.</li> <li>• Learn and apply basic techniques used in chemistry laboratory for preparation, purification and identification.</li> <li>• Employ the basic techniques used in chemistry laboratory for analyze s such as volumetric titrations, conductometric, and Pinsky-Martens apparatus.</li> <li>• Learn about the experiments related to water analysis, including hardness determination, alkalinity and relevant chemical experiments.</li> </ul>
EE110T Fundamentals of Electrical Engineering	<ul style="list-style-type: none"> <li>• Understand Units and dimensions, Ohm's Law, Kirchoff's Law, Superposition theorem, Thevenin's theorem and their application.</li> <li>• Understand Generation of sinusoidal AC voltage, definition of average value, R.M.S. value, form factor and peak factor of AC quantity, Concept of phasor etc.</li> <li>• Understand Basic definitions, magnetization characteristics of Ferro magnetic materials, self inductance and mutual inductance, energy in linear magnetic systems, coils connected in series, AC excitation in magnetic circuits, magnetic field produced by current carrying conductor, Force on a current carrying conductor.</li> </ul>
EE110P Fundamentals of Electrical Engineering	<ul style="list-style-type: none"> <li>• Develop Verificatiions of Thevenin's theorem, Superposition theorem.</li> <li>• Study of Transformer, name plate rating, determination of ratio and polarity.</li> <li>• Identification of different Electronics components.</li> <li>• Study of Power Factor Meter.</li> <li>• Study of Ammeter, Voltmeter and Wattmeter</li> </ul>
EC112T Electronics – I	<ul style="list-style-type: none"> <li>• Able to understand the working of diode.</li> <li>• To understand the basics of number system &amp; how different operation perform on them.</li> <li>• Able to understand the Boolean algebra &amp; logic Gate.</li> <li>• Able to understand the different types of signal in communication system.</li> <li>• Able to understand the Fourier transform..</li> </ul>
EC112P Electronics – I	<ul style="list-style-type: none"> <li>• Calculated the VI –characteristics of different types of diode.</li> <li>• Perform different Boolean logic.</li> <li>• Understand the working of rectifier</li> </ul>
ME112T Concepts in	<ul style="list-style-type: none"> <li>• Understand the broad scope of design engineering.</li> <li>• Describe how human variation impacts on design engineering.</li> </ul>

Engineering Design	<ul style="list-style-type: none"> <li>• Apply some basic concepts and methods from design engineering to explore creative solutions to clearly defined real world problems.</li> <li>• Understand the manner in which design thinking process.</li> <li>• Develop a solution for an engineering issue.</li> <li>• Determine the system's requirements and limitations for product development.</li> <li>• Make a model prototype.</li> </ul>
ME113P Manufacturing Practices*	<ul style="list-style-type: none"> <li>• Understand Practice in filing. Making Vee Joints, Square, Dovetail joints and Key making - plumbing. Suggested Mini project – Assembly of simple I.C. engines.</li> <li>• Understand tools and equipments– practice. Making rectangular tray, hopper, scoop, etc. Tools and equipment's – Arc welding of butt joint, Lap joint, Tee fillet. Demonstration of gas welding, TIG &amp; MIG welding.</li> <li>• An ability to use the methods, abilities, and cutting-edge engineering instruments required for engineering practice.</li> <li>• An ability to design and carry out experiments.</li> </ul>
CS110P Computer Programming*	<ul style="list-style-type: none"> <li>• Understand the basic principles of programming, including variables, data types, operators, and control structures.</li> <li>• Create and analyze algorithms for various computational tasks.</li> <li>• Understand the program development life cycle using various tools like flowcharts and algorithms and pseudo-code.</li> <li>• Classify operators, expressions, character set, data types and control structures.</li> <li>• Understand the concept of modular programming and code reusability using library functions.</li> <li>• Write programs using object oriented concepts like classes and objects, file handling.</li> </ul>
HU112P Rural Outreach*	<ul style="list-style-type: none"> <li>• Understand the demographics of rural areas, including population distribution, age groups, and gender ratios, related these to the social and cultural context of the village.</li> <li>• Analyze the literacy rates in rural regions and correlate them with socio-cultural factors to gain insights into the educational landscape.</li> <li>• Examine the geographical parameters of the village, such as location, topography, and climate, and understand their impact on the local community and environment.</li> <li>• Synthesize collected information and observations to create reports or presentations that highlight the socio-cultural richness and challenges of the rural areas studied.</li> <li>• Reflect on the importance of rural outreach and its role in fostering social awareness and cultural appreciation among students.</li> </ul>

### Semester-III

<b>Course Code/ Name</b>	<b>Course Outcomes</b>
MA220T Mathematic-III	<ul style="list-style-type: none"><li>• Apply the fundamental concepts of Ordinary Differential Equations and Partial Differential Equations and the basic numerical methods for their resolution.</li><li>• Solve the problems choosing the most suitable method</li><li>• Understand the difficulty of solving problems analytically and the need to use numerical approximations for their resolution.</li><li>• Use computational tools to solve problems and applications of Ordinary Differential Equations and Partial Differential Equations.</li><li>• Formulate and solve differential equation problems in the field of Industrial Organization Engineering.</li><li>• Use an adequate scientific language to formulate the basic concepts of the course</li></ul>
EC221T Digital Circuits & System	<ul style="list-style-type: none"><li>• Explain number systems, logic gates, logic functions and simplify Boolean functions.</li><li>• Design and analyze combinational and sequential logic circuits through HDL models</li><li>• Optimize combinational and sequential logic Circuits.</li><li>• Design and implement shift registers and counters digital circuits</li><li>• Design and Implement a memory cell and programmable logic device.</li></ul>
EC221P Digital Circuits & System	<ul style="list-style-type: none"><li>• Design and implement combinational circuits using logic gates and breadboards</li><li>• Design and implement sequential circuits using logic gates and breadboards</li><li>• Write programs in Verilog HDL for structural, behavioural and data flow models for combinational and sequential circuits</li><li>• Understanding the digital logic circuits and their use in combinational and sequential logic circuit design</li></ul>
EC222T Network Analysis	<ul style="list-style-type: none"><li>• Solve network problems using mesh current and node voltage equations</li><li>• Formulate and solve network equations using differential equations and thus, to design resonant circuits</li><li>• Compute responses of first order and second order networks using time domain analysis and Laplace transforms</li><li>• Analyze the circuits using network theorems</li><li>• Synthesize one port and two port networks using transfer functions</li></ul>
EC222P Network Analysis	<ul style="list-style-type: none"><li>• Analyze the circuit using Kirchhoff's law and Network simplification theorems.</li><li>• Infer and evaluate transient response, Steady state response, network functions</li><li>• Obtain the maximum power transfer to the load, and analyze the series resonant and parallel resonant circuit</li><li>• Evaluate two-port network parameters, design attenuators and equalizers</li><li>• Synthesize one port network using Foster and Causer Forms.</li></ul>
EC223T Electronic Devices &	<ul style="list-style-type: none"><li>• Study and analyze the behavior of semiconductor devices</li><li>• Characterize the current flow of a bipolar transistor in CB, CE and CC configurations</li></ul>

Circuits	<ul style="list-style-type: none"> <li>• Bias the transistors and FETs for amplifier applications</li> <li>• Study and analyze amplifier circuits using MOSFETs</li> <li>• Design BJT amplifiers with h- parameters</li> </ul>
EC223P Electronic Devices & Circuits	<ul style="list-style-type: none"> <li>• Operate electronic test equipment and hardware tools and to use the same for conducting experiments.</li> <li>• Draw and analyze VI characteristics of various diodes.</li> <li>• Analyze the input and output characteristics of various transistors and plot the frequency response of amplifier circuits.</li> </ul>
EC224T Measurements and Instrumentation	<ul style="list-style-type: none"> <li>• Discuss the static and dynamic characteristics and define various errors.</li> <li>• Derive torque equation for different types of meters.</li> <li>• Calculate R, L, and C using bridges.</li> <li>• Explain storage and display devices.</li> <li>• Discuss the types of transducers.</li> </ul>
EC224P Measurements and Instrumentation	<ul style="list-style-type: none"> <li>• Measure various parameters viz. voltage, current, resistance using Digital Multimeter.</li> <li>• Analyze sine/square wave in frequency domain using spectrum analyzer.</li> <li>• Analyze LVDT, RTD, Lissajous patterns.</li> </ul>
HU220T Communication Skills	<ul style="list-style-type: none"> <li>• Students will be able to find, use, and evaluate primary academic writing associated with the communication discipline.</li> <li>• Communicate effectively in English in multi-cultural professional and academic contexts.</li> <li>• Understand the role of high level communication skills in professional engineering and research practice.</li> </ul>
HU220P Communication Skills	<ul style="list-style-type: none"> <li>• Bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking.</li> <li>• Improve interpersonal communication</li> <li>• Overcome stage fright and enhance confidence</li> <li>• Participate in GDs</li> </ul>
HU221P Idea Generation*	<ul style="list-style-type: none"> <li>• Develop solutions to workplace problems through applying appropriate problem solving techniques</li> <li>• Incorporate whole brain thinking strategies into personal approach to solving problems in the workplace.</li> <li>• Recognize and overcome barriers to using creative problem solving in management practices and decisions.</li> <li>• Develop a strategic plan for incorporating creative problem solving into an organization.</li> </ul>
HU222P Learning Through Experts*	<ul style="list-style-type: none"> <li>• Communicate effectively in the language of the target country and read appropriate vernacular materials in our field.</li> <li>• Apply research methods in psychology, including design, data analysis, and interpretation to a research project.</li> <li>• Demonstrate the ability to read, evaluate and interpret general economic information.</li> </ul>
HU223P NSS/NCC*	<ul style="list-style-type: none"> <li>• Evoke social consciousness among students through various activities.</li> <li>• Develop youth leadership in the students</li> <li>• Create awareness of the students in Attention, saluting, March shooting etc.</li> <li>• Develop skill of the students regarding Hockey, Khokho, track events, field events and various asanas as well as physical Fitness and Health Education</li> </ul>

## Semester-IV

<b>Course Code/ Name</b>	<b>Course Outcomes</b>
EC225T Signals and Systems	<ul style="list-style-type: none"><li>• Classify the signals as continuous time and discrete time signals and classify systems based on their properties.</li><li>• Determine the response of LTI system using convolution sum for DT system and Convolution Integral for CT system</li><li>• Apply Fourier series and Fourier Transform for periodic Signals</li><li>• Analyze system using Laplace transform and realize the structure for CT system</li><li>• Analyze system using Z transform and realize the structure for DT system</li></ul>
EC225P Signals and Systems	<ul style="list-style-type: none"><li>• Introduction to MATLAB</li><li>• Implement delta function, unit step function, Ramp function.</li><li>• Explore the effect of transformation of signal parameters (amplitude-scaling, time scaling and time-shifting).</li><li>• Explore the different property of system.</li><li>• Demonstrate the convolution and correlation of two continuous-time signals.</li><li>• Demonstrate the convolution and correlation of two discrete-time signals.</li></ul>
EC226T Integrated Circuits and its Applications	<ul style="list-style-type: none"><li>• Analyze and understand the fundamental operations of Analog ICs.</li><li>• Design analog circuits using Op-Amps.</li><li>• Analyze and describe the working of signal generators.</li><li>• Explain the working of Voltage Reference and Regulator circuits.</li><li>• Analyze the operation of analog to digital and digital to analog converters.</li></ul>
EC226P Integrated Circuits and its Applications	<ul style="list-style-type: none"><li>• Perform algebraic operations and generate waveforms using Op-amp IC741.</li><li>• Design analog filters using Op-amp IC741, monostable and astable multivibrator using IC555</li><li>• Analyze voltage regulator using IC723 and design PLL using LM565.</li></ul>
EC227T Communication Systems	<ul style="list-style-type: none"><li>• Explain , Fourier transform of impulse, step, signum , cosine, sine, gate pulse, constant, properties of impulse function</li><li>• Design and analyze Equation and its frequency domain representation, Bandwidth, Power requirement, efficiency</li><li>• Explain Tuned radio receiver &amp; super heterodyne, and give limitation of TRF, IF frequency, image signal rejection, selectivity, sensitivity and fidelity and also explain Noise in AM, FM.</li><li>• Design and implement methods of generation (Direct &amp; Indirect), detection of FM (discriminators: balanced, phase shift and PLL detector)</li><li>• Explain Block diagram of FM transmitter &amp; receiver. Block diagram of FM transmitter &amp; receiver</li></ul>
EC227P Communication Systems	<ul style="list-style-type: none"><li>• Analyze characteristics of AM &amp; FM modulator &amp; Demodulators.</li><li>• Analyze characteristics of super heterodyne receivers.</li><li>• Construct and verify pre emphasis and de-emphasis and plot the wave forms.</li><li>• Construct frequency multiplier circuit and to observe the waveform.</li><li>• Design and analyze characteristics of FM modulator and AM Demodulator using PLL</li></ul>

EC228T Control Systems	<ul style="list-style-type: none"> <li>• Derive the transfer function of a given system using mathematical models.</li> <li>• Determine the time response of systems and analyze the steady state error.</li> <li>• Calculate the frequency domain specifications using frequency response plots.</li> <li>• Determine and analyze the stability of given system.</li> <li>• Solve the state equations using state space model and obtain the controllability and observability of the given system.</li> </ul>
ES220T Material Science	<ul style="list-style-type: none"> <li>• Understand the terminology associated with engineering thermodynamics and have knowledge of contemporary issues related to metallurgical thermodynamics.</li> <li>• Knowledge of phase equilibria in two-component and multi-component systems Estimate thermodynamic properties of an alloy in solid or liquid state of ideal and real mixture</li> <li>• Predict the phase transformations in an alloy system with an understanding of phase diagrams.</li> </ul>
ES221T System Engineering	<ul style="list-style-type: none"> <li>• Identify different types of systems through key behaviours and functionality</li> <li>• Identify and analyze the various phases in a system's life-cycle, and demonstrate an understanding of the importance of considering a system's life-cycle early in the design effort</li> <li>• Understand different types of requirements, constraints, and assumptions encountered during systems design</li> <li>• Gather, analyze, and communicate requirements to technical and non-technical audiences</li> <li>• Identify, analyze, and objectively resolve design trade-offs</li> </ul>
EC229P Simulation Lab	<ul style="list-style-type: none"> <li>• Understand the main features and importance of the MATLAB/ SCI LAB mathematical programming environment.</li> <li>• Apply working knowledge of MATLAB/ SCI LAB package to simulate and solve Electrical, Electronics circuits and Applications.</li> <li>• Solve, Simulate and Analyze various DC and AC circuits.</li> <li>• Solve, Simulate and Analyze simple Transformer and DC Generator circuits.</li> </ul>
HU223P NSS/NCC*	<ul style="list-style-type: none"> <li>• Evoke social consciousness among students through various activities.</li> <li>• Develop youth leadership in the students</li> <li>• Create awareness of the students in Attention, saluting, March shooting etc.</li> <li>• Develop skill of the students regarding Hockey, Khokho, track events, field events and various asanas as well as physical Fitness and Health Education</li> </ul>

### Semester-V

<b>Course Code/ Name</b>	<b>Course Outcomes</b>
EC501T Electromagnetic Theory	<ul style="list-style-type: none"> <li>• Apply vector calculus to solve static electric and magnetic field problems for different engineering applications.</li> <li>• Solve Maxwell's equations using vector calculus by using three standard coordinate systems.</li> <li>• Analyze electromagnetic wave propagation in guiding media under various</li> </ul>

	<p>matching conditions.</p> <ul style="list-style-type: none"> <li>Analyze and compute the power flow mechanisms in bounded and unbounded medium.</li> <li>Deduce EM wave propagation in free space and dielectric medium.</li> </ul>
EC502T Voice & Data Communication	<ul style="list-style-type: none"> <li>Analyze network communication using the layered concept, Open System Interconnect (OSI) and the Internet Model.</li> <li>Analyze various types of transmission media, network devices; and parameters of evaluation of performance for each media and device.</li> <li>Solve the concept of flow control, error control and LAN protocols; to explain the design of, and algorithms used in, the physical, data link layers.</li> <li>Apply the working principles of LAN and the concepts behind physical and logical addressing, subnetting and supernetting.</li> <li>Understanding the functions performed by a Network Management System and to analyze connection establishment and congestion control with respect to TCP Protocol.</li> <li>Analyze the principles and operations behind various application layer protocols like HTTP, SMTP, FTP.</li> </ul>
EC503T Digital Communication	<ul style="list-style-type: none"> <li>Analyze the sampling process and different types of digital pulse modulation techniques.</li> <li>Describe the baseband pulse transmission and ISI and to construct the duobinary coding.</li> <li>Compare the performance of various digital modulation systems for the pass-band data transmission.</li> <li>Apply the different types of error control coding techniques.</li> <li>Illustrate the methods of spread spectrum modulation and its performance parameters.</li> </ul>
EC503P Digital Communication	<ul style="list-style-type: none"> <li>Able to analyze digital modulation techniques by using MATLAB tools.</li> <li>Able to identify and describe different techniques in modern digital communications, in particular in source coding using MAT Lab tools.</li> <li>Able to perform channel coding.</li> </ul>
EC504T Microprocessors & Microcontrollers	<ul style="list-style-type: none"> <li>Develop assembly language program to solve mathematical problems using 8bit and 16 bit microprocessors.</li> <li>Create a multiprocessor system with 8086 microprocessor.</li> <li>Interface I/O and memory devices with 8086 microprocessor.</li> <li>Analyze the architecture and signals of 8051 microcontroller.</li> <li>Develop a real time system using 8051 microcontroller.</li> </ul>
EC504P Microprocessors & Microcontrollers	<ul style="list-style-type: none"> <li>Analyze assembly language programs; select appropriate assemble into machine a cross assembler utility of a microprocessor and microcontroller.</li> <li>Design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to external devices.</li> <li>Evaluate assembly language programs and download the machine code that will provide solutions real-world control problems.</li> </ul>
EC505T Communication Network and Transmission Lines	<ul style="list-style-type: none"> <li>Analyze electromagnetic wave propagation in generic transmission line geometries.</li> <li>Design impedance matching transmission line and calculate the reflection coefficient, SWR, using smith chart.</li> <li>Analyze guided waves and their field pattern between parallel planes of perfect conductors.</li> </ul>

	<ul style="list-style-type: none"> <li>• Design and measure the various propagating modes of rectangular wave guides.</li> <li>• Derive the field equation of circular waveguides and resonators.</li> </ul>
EC505P Communication Network and Transmission Lines	<p>Able to understand basic theories of Digital communication system in practical.</p> <ul style="list-style-type: none"> <li>• Able to design and implement different modulation and demodulation techniques.</li> <li>• Able to analyze digital modulation techniques by using MATLAB tools.</li> </ul>
HU223P NSS/NCC*	<ul style="list-style-type: none"> <li>• Evoke social consciousness among students through various activities.</li> <li>• Develop youth leadership in the students</li> <li>• Create awareness of the students in Attention, saluting, March shooting etc.</li> <li>• Develop skill of the students regarding Hockey, Khokho, track events, field events and various asanas as well as physical Fitness and Health Education</li> </ul>
EC506P Electronic Design Lab – I	<ul style="list-style-type: none"> <li>• Analyze the characteristics of amplifiers.</li> <li>• Analyze the characteristics of Oscillators.</li> <li>• Analyze the characteristics of Multivibrators.</li> <li>• Analyze the characteristics of tuned amplifiers.</li> <li>• Analyze the frequency response of amplifiers using pSpice.</li> <li>• Model the design of electronic circuits using PSpice.</li> </ul>
EC507P Soft Skill-I	<ul style="list-style-type: none"> <li>• Ability to make use of techniques for self-awareness and self-development.</li> <li>• Ability to apply the conceptual understanding of communication into everyday practice.</li> <li>• Ability to understand the importance of teamwork and group discussions skills.</li> <li>• Ability to develop time management and stress management.</li> <li>• Ability to Apply business etiquette skills effectively an engineer requires.</li> </ul>
EC508P Seminar/Group Discussion	<ul style="list-style-type: none"> <li>• Able to introduce oneself and family and work on Non verbal Communication.</li> <li>• Learn to work on oral skills like conversational practices, extempore and role play.</li> </ul>

## Semester-VI

Course Code/ Name	Course Outcomes
EC601T Industrial Electronics	<ul style="list-style-type: none"> <li>• Demonstrate the characteristics of power semiconductor devices.</li> <li>• Design firing circuit for Thyristors</li> <li>• Analyze the operation of converters.</li> <li>• Develop power semiconductor circuits to electrical power system</li> <li>• Construct power semiconductor circuits for industrial applications</li> <li>• Analyze power semiconductor circuits for domestic applications</li> </ul>
EC602T Cellular Mobile Communication	<ul style="list-style-type: none"> <li>• Explain the basic cellular radio concepts and capacity expansion techniques in a cellular system.</li> <li>• Analyze the concept of equalization and diversity techniques.</li> <li>• Analyze the various speech coding.</li> <li>• Explain the various multiple access techniques for wireless communications.</li> <li>• Analyze the various wireless systems and standards in mobile</li> </ul>

	communication.
EC603T Digital Signal Processing	<ul style="list-style-type: none"> <li>• Classify the signals as Continuous time and Discrete time.</li> <li>• Analyze the spectral characteristics of signals using Fourier analysis.</li> <li>• Classify systems based on their properties and determine the response of LTI system using convolution.</li> <li>• Identify system properties based on impulse response and Fourier analysis.</li> <li>• Apply transform techniques to analyze continuous-time and discrete-time signals and systems</li> </ul>
EC603P Digital Signal Processing	<ul style="list-style-type: none"> <li>• Able to Implement HP IIR filter for a given sequence.</li> <li>• Able to Implement and design LP IIR filter for a given sequence.</li> <li>• Able to Implement HP FIR filter for a given sequence and plot the response of the same.</li> <li>• Able to Implement LP FIR filter for a given sequence and calculate the filter coefficients.</li> </ul>
EC604T Antenna & Wave Propagation	<ul style="list-style-type: none"> <li>• Analyze the antenna fundamentals and Radiation pattern.</li> <li>• Evaluate the different parameters of antenna arrays.</li> <li>• Design microwave antennas for the given specifications.</li> <li>• Analyze the different measurement techniques of antenna parameters and special antennas.</li> <li>• Analyze the atmospheric and terrestrial effects on radio wave propagation.</li> </ul>
EC604P Antenna & Wave Propagation	<ul style="list-style-type: none"> <li>• Ability to understand the basic operation and working of Microwave Tubes.</li> <li>• Application of microwave and RF antenna for industrial and scientific purpose.</li> <li>• Identify the state of art microwave tubes and semiconductors.</li> <li>• Their real use in real life.</li> </ul>
EC605T VLSI Circuits & Systems	<ul style="list-style-type: none"> <li>• Identify the various IC fabrication methods.</li> <li>• Express the Layout of simple MOS circuit using Lambda based design rules.</li> <li>• Apply the Lambda based design rules for subsystem design</li> <li>• Differentiate various FPGA architectures.</li> <li>• Design an application using Verilog HDL.</li> <li>• Concepts of modeling a digital system using Hardware Description Language.</li> </ul>
EC605P VLSI Circuits & Systems	<ul style="list-style-type: none"> <li>• Model of digital circuit.</li> <li>• Digital circuit with, simulate, synthesis in Micro wind.</li> <li>• Understand chip level issues.</li> <li>• Design digital CMOS circuits for specified applications</li> <li>• Need of testability</li> </ul>
HU223P NSS/NCC*	<ul style="list-style-type: none"> <li>• Evoke social consciousness among students through various activities.</li> <li>• Develop youth leadership in the students</li> <li>• Create awareness of the students in Attention, saluting, March shooting etc.</li> <li>• Develop skill of the students regarding Hockey, Khokho, track events, field events and various asana as well as physical Fitness and Health Education</li> </ul>
EC606P Electronic Design Lab – II	<ul style="list-style-type: none"> <li>• Design different forms of power supply.</li> <li>• Design Voltage regulators</li> <li>• AM/FM Trans receiver.</li> <li>• Know the design procedure of Instrumentation amplifier and Digital Indicator.</li> </ul>

	<ul style="list-style-type: none"> <li>• Learn CAD based PCB layout design.</li> <li>• Understand the working of modems and timers.</li> </ul>
EC607P Soft Skill-II	<ul style="list-style-type: none"> <li>• Become more effective individual through goal/target setting.</li> <li>• Self motivation and practicing creative thinking.</li> <li>• Function effectively in multi-disciplinary.</li> <li>• Heterogeneous teams through the knowledge of team work, Inter-personal relationships.</li> <li>• Conflict management and leadership quality.</li> </ul>
EC608P Seminar/Group Discussion	<ul style="list-style-type: none"> <li>• Students will be able to judge when to speak and how much to say.</li> <li>• Speak clearly and audibly in a manner appropriate to the subject.</li> <li>• Ask appropriate questions, use evidence to support claims.</li> <li>• Respond to a range of questions, take part in meaningful discussion to reach a shared understanding.</li> <li>• Speak with or without notes.</li> <li>• Show depth of understanding, demonstrate breadth of reading.</li> <li>• And use primary and secondary sources, show independence.</li> <li>• Flexibility of thought, help discussions to move forward.</li> <li>• Show intellectual leadership and effective time management.</li> </ul>

## Semester-VII

<b>Course Code/ Name</b>	<b>Course Outcomes</b>
<b>Elective-I</b> EC7011T Wireless Communication	<ul style="list-style-type: none"> <li>• Apply the knowledge of basic communication systems and its principles, describe the Wireless Systems and analyze the Spectrum Allocation.</li> <li>• Mathematically analyze mobile radio propagation mechanisms and diversity Techniques.</li> <li>• Analyze the Path loss models, Design Base Station (BS) parameters and analyze the antenna configurations.</li> <li>• Analyze and examine the multiple access techniques and its application.</li> <li>• Assess the latest wireless technologies.</li> </ul>
EC7012T Digital Image Processing	<ul style="list-style-type: none"> <li>• Describe the fundamentals of monochrome and color image processing and analyze the basic relations between pixels, connectivity and distance measures.</li> <li>• Apply DFT DCT, DST, Walsh, Hadamard, Haar, wavelet and SVD transform for images.</li> <li>• Apply image enhancement techniques in spatial and frequency domain.</li> <li>• Analyze image restoration using constrained and unconstrained filters and image segmentation approaches.</li> <li>• Appraise the need for image compression using lossy and lossless techniques and Morphological operations.</li> </ul>
EC-7013T Programming Language –I (C & C++)	<ul style="list-style-type: none"> <li>• Develop a C program</li> <li>• Control the sequence of the program and give logical outputs</li> <li>• Implement strings in your C program</li> <li>• Store different data types in the same memory</li> <li>• Manage I/O operations in your C program</li> </ul>

	<ul style="list-style-type: none"> <li>• Repeat the sequence of instructions and points for a memory location</li> <li>• Apply code reusability with functions and pointers</li> <li>• Understand the basics of file handling mechanisms</li> <li>• Explain the uses of pre-processors and various memory models</li> </ul>
EC702T Satellite Communication	<ul style="list-style-type: none"> <li>• Analyze the satellite orbits.</li> <li>• Analyze the space segment and budget equation</li> <li>• Analyze the earth segment and various test equipment's</li> <li>• Analyze the various multiple access techniques.</li> <li>• Know the latest trends in satellite and its applications</li> </ul>
EC703T Optical Communication	<ul style="list-style-type: none"> <li>• Analyze the basic elements and laws of optical fiber transmission systems.</li> <li>• Analyze the causes for signal degradation in optical fibers.</li> <li>• Illustrate the working of optical sources and coupling techniques.</li> <li>• Evaluate the noise performance in fiber optic receiver.</li> <li>• Analyze the digital transmission systems.</li> </ul>
EC703P Optical Communication	<ul style="list-style-type: none"> <li>• Describe and mathematically analyze optical components used in communication systems.</li> <li>• Understand the principles of optical communication system design.</li> <li>• Analytically evaluate the performance and technical merits of an optical communication system.</li> <li>• Be conversant in the major application areas for optical communication systems.</li> <li>• Design an optical communication system</li> <li>• Identify and describe the major sources of noise and signal impairments in an optical communication system.</li> </ul>
EC704T Microwave Engineering	<ul style="list-style-type: none"> <li>• Explain the two RF circuits and networks used in Microwave communication systems.</li> <li>• Analyze the multi- port RF networks and RF transistor amplifiers.</li> <li>• Analyze the passive &amp; active Microwave devices and circuits.</li> <li>• Analyze the microwave generation and to design the Micro strip lines.</li> <li>• Measure and analyze Microwave signal parameters.</li> </ul>
EC704P Microwave Engineering	<ul style="list-style-type: none"> <li>• Measure microwave signals and parameters.</li> <li>• Analyze the performance behaviour of microwave components.</li> <li>• Demonstrate the characteristics of Microwave sources</li> <li>• Demonstrate the characteristics of directional Couplers</li> <li>• To analyze the radiation pattern of antenna</li> <li>• Practice microwave measurement procedures</li> </ul>
EC705T Computer Networks	<ul style="list-style-type: none"> <li>• Explain the basic concept in modern data communication and computer networking.</li> <li>• Analyze the functions and services of data link layer.</li> <li>• Categorize the functions and services of network layer.</li> <li>• Examine the basic functions of transport layer and congestion in networks.</li> <li>• Analyze the concepts of various network applications and data security.</li> </ul>
EC705P Computer Networks	<ul style="list-style-type: none"> <li>• Explain basic concepts, OSI reference model, services and role of each layer of OSI model and TCP/IP, networks devices and transmission media, Analog and digital data transmission</li> <li>• Apply channel allocation, framing, error and flow control techniques.</li> <li>• Describe the functions of Network Layer i.e. Logical addressing, subnetting</li> </ul>

	<p>&amp; Routing Mechanism.</p> <ul style="list-style-type: none"> <li>• Explain the different Transport Layer function i.e. Port addressing, Connection Management, Error control and Flow control mechanism.</li> <li>• Explain the functions offered by session and presentation layer and their Implementation.</li> <li>• Explain the different protocols used at application layer i.e. HTTP, SNMP, SMTP, FTP, TELNET and VPN.</li> </ul>
HU224P Yoga*	<ul style="list-style-type: none"> <li>• Demonstrate basic skills associated with yoga activities including strength and flexibility, balance and coordination.</li> <li>• Demonstrate the ability to perform yoga movements in various combination and forms.</li> <li>• Understand and apply the knowledge of basic sequencing, and effective group management.</li> </ul>
EC706P Electronic Design Lab – III	<ul style="list-style-type: none"> <li>• Design different forms of power supply.</li> <li>• Design Voltage regulators</li> <li>• AM/FM transreceiver.</li> <li>• Know the design procedure of Instrumentation amplifier and Digital Indicator.</li> <li>• Learn CAD based PCB layout design.</li> <li>• Understand the working of modems and timers.</li> </ul>
EC707P Minor Project	<ul style="list-style-type: none"> <li>• Practice acquired knowledge within the chosen area of technology for project development</li> <li>• Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach</li> <li>• Reproduce, improve and refine technical aspects for engineering projects</li> <li>• Work as an individual or in a team in development of technical projects</li> <li>• Report project related activities effectively to peers and mentors</li> </ul>
EC708P Industrial Training	<ul style="list-style-type: none"> <li>• Knack to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills.</li> <li>• Ability to identify, formulate and model problems and find engineering solution based on a systems approach.</li> <li>• Capability and enthusiasm for self-improvement through continuous professional development and life-long learning</li> <li>• Awareness of the social, cultural, global and environmental responsibility as an engineer.</li> </ul>

### **Semester-VIII**

<b>Course Code/ Name</b>	<b>Course Outcomes</b>
<b>Elective-II</b> EC8011T Microwave Circuit	<ul style="list-style-type: none"> <li>• Measure performance of simple microwave circuits and devices.</li> <li>• Perform microwave measurements with sophisticated instruments such as vector network analyzer and spectrum analyzer</li> <li>• Analyze typical microwave networks using impedance, admittance, transmission and scattering matrix representations.</li> <li>• Design microwave matching networks using L section, single and double stub and quarter wave transformer.</li> </ul>
EC8012T	<ul style="list-style-type: none"> <li>• Have knowledge about the basic working of a microcontroller system and</li> </ul>

Microcontrollers for Embedded System	<p>its programming in assembly language.</p> <ul style="list-style-type: none"> <li>• Provide experience to integrate hardware and software for microcontroller applications systems.</li> <li>• Develop and maintain applications written using Embedded C.</li> <li>• Independently design and develop a hardware platform encompassing a microcontroller and peripherals.</li> </ul>
EC8013T Advanced Data Network	<ul style="list-style-type: none"> <li>• Understand the basic concepts of data communication architectures and protocols.</li> <li>• Able to analyze the performance of a network using probability tools and queuing theory</li> <li>• Understand networking techniques including scheduling, routing, and switching</li> <li>• Understand data network applications</li> </ul>
EC8014T Programming Language-II (JAVA)	<ul style="list-style-type: none"> <li>• knowledge of the structure and model of the Java programming language, (knowledge)</li> <li>• use the Java programming language for various programming technologies (understanding)</li> <li>• develop software in the Java programming language, (application)</li> <li>• evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements (analysis)</li> <li>• propose the use of certain technologies by implementing them in the Java programming language to solve the given problem (synthesis)</li> <li>• choose an engineering approach to solving problems, starting from the acquired knowledge of programming and knowledge of operating systems. (evaluation)</li> </ul>
EC802T Advanced Communication System	<ul style="list-style-type: none"> <li>• Provide student with theoretical background and applied knowledge so that they can design an optimum Single and multi-carrier communication system under given power, spectral and error performance constraints.</li> <li>• Analyze the error performance of digital modulation techniques</li> <li>• Apply discrete-time and continuous-time signal theory to estimate the signal parameters</li> <li>• Extract useful information from random observations in communications.</li> </ul>
EC803T VLSI Design	<ul style="list-style-type: none"> <li>• Design VHDL code for combinational circuits and sequential circuits</li> <li>• Analyze MOS and CMOS transistor characteristics</li> <li>• Illustrate the fabrication processes of CMOS</li> <li>• Design CMOS combinational circuit.</li> <li>• Design sequential circuits and test CMOS circuits.</li> </ul>
EC803P VLSI Design	<ul style="list-style-type: none"> <li>• Understand chip level issues and need of testability.</li> <li>• Design digital CMOS circuits for specified applications.</li> <li>• Model digital circuit with, simulate, synthesis in Micro wind.</li> </ul>
EC804T TV & Radar Engineering	<ul style="list-style-type: none"> <li>• Understand the building blocks used in radio and television systems.</li> <li>• Analyze and determine the performance of transmitter and receiver circuits.</li> <li>• Understand the principles of Colour Television operation.</li> <li>• Compare the performance of TV standards and Cameras</li> </ul>
EC804P TV & Radar Engineering	<ul style="list-style-type: none"> <li>• Understand radio-frequency systems and their applications</li> <li>• Analyze the performance parameters of radio frequency circuits</li> </ul>

	<ul style="list-style-type: none"> <li>• Analyze the performance parameters of radio frequency circuits</li> <li>• identify design trade-off of radio frequency communication systems</li> </ul>
EC805P Major Project	<ul style="list-style-type: none"> <li>• Use various tools and techniques to study existing systems</li> <li>• Critically analyze existing systems, thereby select and justify parameters to be improved</li> <li>• Start and manipulate proposed engineering solution as per industry / research / societal need</li> <li>• Achieve precision in uses of the tools related to their experiments/fabrication</li> <li>• Reorganize and refine various components of technology to optimize the resources at large</li> <li>• Appraise the potential of technology for scalability and wide spectrum of applications</li> <li>• Report project related activities effectively to peers, mentors and society</li> <li>• Follow and value health, safety and ethical practices during project</li> </ul>
EC806P Seminar/Group Discussion	<ul style="list-style-type: none"> <li>• Demonstrate clarity, the strength of their thesis statement, and develop their topic with appropriate signposting.</li> <li>• Able to use appropriate registers and vocabulary, and will demonstrate command of voice modulation, voice projection, and pacing.</li> <li>• Able to make use of visual, audio and audio-visual material to support their presentation.</li> <li>• Able to speak cogently with or without notes. Students will present either in groups or as individuals.</li> </ul>