



TEEGALA KRISHNA REDDY ENGINEERING COLLEGE
UGC - AUTONOMOUS

Approved by AICTE, Affiliated by JNTUH, Accredited by NAAC- 'A' Grade

Medbowli, Meerpet, Balapur, Hyderabad, Telangana- 500097

Mob: 8498085218, Email: info@tkrec.ac.in, website: www.tkrec.ac.in



DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

2019-20

Subject Name: Mathematics-I

Subject code: MA101BS

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Write the matrix form of a set of linear equations and to analyze the solution of the system of equations.
2. Reduce the Quadratic form to Canonical form.
3. Describe the nature of sequence and series
4. Apply the mean value theorems.
5. Calculate the extreme values of functions of two variables with / without constraints.

Subject Name: Applied Physics

Subject code: AP102BS

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Gain knowledge on fundamentals of modern physics and quantum mechanics and utilize the knowledge in various applications
2. Able to apply various electronic circuits by the fundamentals of semiconductor physics
3. Able to apply the concepts of optoelectronics in various optoelectronics devices.
4. Able to apply the learned knowledge of LASER and Fibre optics in communication systems.
5. Understand various magnetic properties, electromagnetism and applications magnetic materials.



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Subject Name: Programming for Problem Solving

Subject code: CS103ES

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Build the algorithm for the given unsolved problems.
2. Apply the concepts of arrays, pointers, strings and structures to find the solution for given problem.
3. Apply the various preprocessor commands in a given different real time situations.
4. Dissect a problem into sub functions to develop modular reusable code.
5. Demonstrate various searching and sorting techniques along with the complexity analysis.

Subject Name: Engineering Graphics

Subject code: ME104ES

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply the principles of Engineering Graphics to create Engineering Drawings of various geometric constructions, conic sections, curves and scales as per BIS standards.
2. Construct orthographic projections for points, lines and planes in different quadrants and Auxiliary views.
3. Draw the sectional views and true shape of sections of solids, by applying principles of projections.
4. Draw the development of surfaces and intersections of solids in Real time situations.
5. Develop isometric and orthographic views of the objects.



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Subject Name: Applied Physics Lab

Subject code: AP105BS

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Able to study the(V-I/P-I) characteristics of LED,LASER and Solar cell.
2. Able to understand the energy gap of semiconductor diode.
3. Correlate the theory of Hall effect with experiment by determining the Hall coefficient.
4. Examine the Bending losses for different Optical fiber cables.
5. Able to understand various concepts-Resonance, Time constant and Magnetic field using LCR, RC, Stewart and Gees circuits.

Subject Name: Programming for Problem Solving Lab

Subject code: CS106ES

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Formulate The Algorithms for Simple Problems
2. Translate the given algorithms to C program.
3. Correct the logical errors found during program execution
4. Make use of pointers in different types to modularize the code with functions.
5. Apply the appropriate sorting techniques for the given list of elements.



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Subject Name: Environmental Science

Subject code: MC109ES

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. The students able to know basic concept of ecological perspective and the value of the environment.
2. The students able to understand the significance of various natural resources and its management.
3. The students able to demonstrate a comprehensive understanding of the world's biodiversity and the importance of its conservation
4. The students able to identify different types of pollution and their control measures, discover effective methods of waste management and come out with best possible solutions.
5. The students able to raise awareness about environmental laws and sustainable development.

Subject Name: Mathematics - II

Subject code: MA201BS

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Determine different types of ordinary differential equations of first order.
2. Apply the concept of differential equation to real world problems.
3. Apply the concept of multiple integrals to find areas, volumes
4. Evaluate the center of mass and gravity for cubes, sphere and rectangular parallelepiped.
5. Calculate the line, surface and volume integrals and converting them from one to another.



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Subject Name: Chemistry

Subject code: CH202BS

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Gain the knowledge of atomic, molecular and electronic changes at different level and its effect on conductivity.
2. Assess the quality of water for industrial and domestic application.
3. Extrapolate the knowledge of corrosion and electrochemical cells.
4. Identify the reaction mechanisms in the synthesis of different molecules in different conditions.
5. Gain the basic required skills to get clear concepts on spectroscopy and application to medical and other fields.

Subject Name: Basic Electrical Engineering

Subject code: EE203ES

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. To understand DC and Single & amp; Three phase AC circuits.
2. Understand and analyze basic Electrical circuits.
3. Study the working principles of Electrical Machines.
4. Study the working principles of Transformers.
5. Introduce components of Low voltage Electrical installations.



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Subject Name: Engineering Workshop

Subject code: ME205ES

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Demonstrate various machines, tools and their operations.
2. Apply different workshop trades like fitting, carpentry, foundry and welding.
3. Practice workshop trades like Tim smithy, Black smithy.
4. Identify suitable tools for different trades of engineering processes including drilling, material removing, measuring, chiseling.
5. Apply basic electrical engineering knowledge for house wiring practice.

Subject Name: English

Subject code: EN205HS

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Use English Language effectively in spoken and written communication.
2. Comprehend the given texts and respond appropriately.
3. Communicate confidently in various contexts and different cultures.
4. Demonstrate basic proficiency in English including reading and listening comprehension, writing and speaking skills.
5. Improve language proficiency to meet their academic and professional needs.



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Subject Name: Engineering Chemistry Lab

Subject code: CH206BS

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Develop experimental skills to design new experiments in engineering.
2. Determination of parameters like hardness and chloride content in water.
3. Estimation of rate constant of a reaction from concentration – time relationships.
4. Determination of physical properties like adsorption and viscosity.
5. Calculation of R_f values of some organic molecules by TLC technique.

Subject Name: English Language and Communication Skills Lab

Subject code: EN207HS

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Employ the nuances of English language through audio-visual experience and group activities.
2. Articulate a neutral accent of English for intelligibility by overcoming mother tongue influence.
3. Develop the skill of using appropriate language in various speaking contexts.
4. Take part in oral presentations using formal language.
5. Improve speaking skills with clarity and confidence which in turn enhance their interpersonal skills.



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Subject Name: Basic Electrical Engineering Lab

Subject code: EE208ES

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Know the basic electrical laws
2. Understand the response of different types of electrical circuits with respect to different excitations.
3. Analyze the basic characteristics of transformers
4. Understand the measurement, calculation and relation between the basic electrical parameters
5. Analyze the basic characteristics of electrical machines.

Subject Name: ELECTRONIC DEVICES AND CIRCUITS

Subject code: EC301PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Acquire the knowledge on PN Junction Diodes.
2. Analyze the characteristics of BJT and its biasing techniques.
3. Analyze the characteristics of FET and Special Purpose Diodes
4. Design the small signal BJT amplifiers.
5. Design and analyze the small signal MOS and FET amplifiers.



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Subject Name: NETWORK ANALYSIS AND TRANSMISSION LINES

Subject code: EC302PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply RLC network concepts in solving electrical and magnetic circuits.
2. Analyze the transient and steady state responses of RLC circuits.
3. Evaluate two port network parameters in designing filters and attenuators.
4. Analyze transmission line parameters.
5. Design transmission lines with different impedances.

Subject Name: DIGITAL SYSTEM DESIGN

Subject code: EC303PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Acquire the knowledge on various types of number system and reduce the Boolean expressions using theorem and properties.
2. Minimize the Boolean functions using K-map and Tabular methods.
3. Design the Combinational and sequential circuits for various cyclic functions.
4. Draw the state diagram for the sequential Logical circuits and implement Finite state machines using Moore and Mealy models.
5. Characterize logic families and compare them with the specifications.



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Subject Name: SIGNALS AND SYSTEMS

Subject code: EC304PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply the concept of orthogonality on signals and systems.
2. Analyze the concepts of Fourier series and Fourier Transform techniques for given specifications.
3. Analyze system characteristics for given specifications.
4. Estimate ROC and stability conditions of S and Z domains for given conditions.
5. Design system using the concept of sampling theorem and correlation.

Subject Name: PROBABILITY THEORY AND STOCHASTIC PROCESSES

Subject code: EC305ES

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply the Concepts of probability and Random variable to real time applications.
2. Analyze probability density and distribution functions for random variables.
3. Determine the temporal characteristics of random processes.
4. Evaluate the spectral density of random Processes.
5. Use the concepts of noise and information theory in communication systems.



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Subject Name: ELECTRONIC DEVICES AND CIRCUITS LAB

Subject code: EC306PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Analyze the behaviour of diodes and transistors.
2. Apply the uses of diodes and BJT in real time.
3. Evaluate Different types of clippers and clampers using PN diodes.
4. Evaluate the transistor configurations.
5. Design the circuits using diodes and transistors.

Subject Name: DIGITAL SYSTEM DESIGN LAB

Subject code: EC307PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Implement the logic gates using universal gates and verify the truth tables
2. Implement the Boolean expression of SOP and POS using logic gates.
3. Implement combinational logical circuits using logic gates (Adders, Subtractors, Encoders, Multiplexers).
4. Implement the SR, D, T and JK Flip Flops with their truth tables.
5. Design the Synchronous and Asynchronous Sequential logical circuits.



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Subject Name: BASIC SIMULATION LAB

Subject code: EC308ES

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Practice the characteristics of signals and its operations.
2. Demonstrate the concept of Correlation and Convolution on given signals and sequences.
3. Analyze the different types of systems to obtain their characteristics.
4. Analyze the given signal using wiener-khinchin relation and noises.
5. Estimate a given system for observing its LTI & Response characteristics.

Subject Name: CONSTITUTION OF INDIA

Subject code: MC309

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Understand the Constitution of India.
2. Understand the Laws in Constitutions of India.
3. Understand the basic concepts of Constitution of India.
4. Understand the benefits of Constitution of India.
5. Understand the implementation of laws of Constitution of India.



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Subject Name: Laplace Transforms, Numerical Methods & Complex Variables

Subject code: MA401BS

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Use the Laplace transforms techniques for solving ODE's
2. Find the root of a given equation.
3. Estimate the value for the given data using interpolation
4. Find the numerical solutions for a given ODE's
5. Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems.

Subject Name: Electromagnetic Fields and Waves

Subject code: EC402PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply the characteristics of basic laws of Electrostatics.
2. Use the Basic laws of Magnetostatics.
3. Distinguish the Maxwell's equations and boundary conditions.
4. Analyze Uniform plane wave characteristics for several media.
5. Evaluate various modes and parameters of waveguides.



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Subject Name: Analog and Digital Communications

Subject code: EC403PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply amplitude modulation and demodulation techniques in communication systems.
2. Use the concepts of angle modulation in communication systems.
3. Analyze working principle of analog transmitters and receivers.
4. Summarize the different pulse code modulation techniques.
5. Estimate probability of error for different digital modulation techniques.

Subject Name: Linear IC Applications

Subject code: EC404PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply the inverting, non-inverting and differential concepts of Op-Amp
2. Use the concepts of op-amp in various applications
3. Distinguish filters and oscillators based on their working principle
4. Analyze the operation and applications of timer and phase locked loop
5. Design ADC and DAC circuits.



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Subject Name: Electronic Circuit Analysis

Subject code: EC405PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Analyze the concepts of Multistage Amplifiers and to describe the high frequency model of BJT.
2. Compare the Feedback Amplifiers Characteristics.
3. Utilize the concepts of Positive feedback to generate sustained oscillations.
4. Analyze the concepts of Power Amplifiers and Tuned Amplifiers.
5. Measure the Time period of Multivibrators and Time base generators.

Subject Name: Analog and Digital Communications Lab

Subject code: EC406PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply the concepts of Modulation and Demodulation to a given signal.
2. Demonstrate the knowledge of Multiplexing and Demultiplexing in Communication System.
3. Analyze various Pulse Modulation techniques.
4. Examine Digital Modulation and Demodulation schemes.
5. Evaluate the performance of Digital Communication system.



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Subject Name: IC Applications Lab

Subject code: EC407PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Analyze the functioning and specifications of standard digital ICs of 74xx series.
2. Design and verify various combinational logic circuits using digital ICs.
3. Design and verify various Sequential logic circuits using digital ICs.
4. Analyze the Characteristics of 74H, LS, HS series IC's.
5. Generate the Clock pulse of 450KHz using NAND/NOR gates.

Subject Name: Electronic Circuit Analysis Lab

Subject code: EC408PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Use Multisim Software to operate the electronic circuits.
2. Analyze the frequency response of single and multi stage Amplifiers.
3. Examine the effect of negative feedback on the frequency response of feedback amplifiers.
4. Compute the frequency of Oscillations for RC and LC oscillators.
5. Evaluate the Multivibrators and Sweep Circuits.



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Subject Name: Gender Sensitization Lab

Subject code: MC409

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Students will have developed a better understanding of important issues related to gender in contemporary India.
2. Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
3. Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
4. Students will acquire insight into the gendered division of labour and its relation to politics and economics.
5. Men and women students and professionals will be better equipped to work and live together as equals.

Subject Name: Microprocessors & Microcontrollers

Subject code: EC501PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Solve programs using 8086 instruction set.
2. Analyze and program 8051 microcontrollers for its applications.
3. Analyze various interfacing devices with 8051 microcontroller.
4. Evaluate simple programs using ARM and their instruction formats.
5. Explain the architecture of Advanced ARM Processors.



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Subject Name: Data Communications and Networks

Subject code: EC502PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Interpret various Standards and Network Models.
2. Analyze widespread protocols of data link layer.
3. Distinguish network layer protocols.
4. Select data transfer protocol for TCP and UDP connections.
5. Evaluate application layer protocols for different services.

Subject Name: Control Systems

Subject code: EC503PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Represent the Mathematical model of a System.
2. Illustrate system performance using time domain specifications.
3. Analyze stability of Control System in frequency domain.
4. Evaluate various controllers to improve system performance.
5. Examine systems through state space representation.



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Subject Name: Business Economics & Financial Analysis

Subject code: SM504MS

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Understand and Learn the Business Economic Concepts in Micro and Macro Business firm
2. Understand microeconomic factors in related to demand and supply analysis and its forecasting
3. Apply the theory of production function and Cost concepts to determine the Break Even Analysis. Remember different market structures, pricing strategies and different forms business organization
4. Determine the financial statement by using Fundamental accounting concepts
5. Interpret the financial statement by using Fundamental accounting concepts and Ratio analysis.

Subject Name: Computer Organization & Operating Systems

Subject code: EC511PE

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Classify different addressing modes for fetching machine instructions.
2. Ability to understand memory system.
3. Ability to explain about Asynchronous Data Transfer Modes.
4. Understand the concepts related to deadlock and memory management.
5. Apply the concept of file system structure.



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Subject Name: Microprocessors & Microcontrollers Lab

Subject code: EC505PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Develop assembly language programming using 8086 instructions.
2. Develop assembly language programming using 8051 instructions.
3. Analyze the delay using timers of 8051.
4. Evaluate the concept of serial communication using 8051.
5. Analyze I/O interfacing techniques on 8051 microcontroller based systems.

Subject Name: Data Communications and Networks Lab

Subject code: EC506PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply the basic concepts of network.
2. Analyze different protocols exist in transport layer
3. Evaluate the performance of different routing protocols.
4. Evaluate the performance of wireless LANs.
5. Design various application protocols.



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Subject Name: ADVANCED COMMUNICATION SKILLS LAB

Subject code: EN508HS

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Develop LSRW skills and soft skills.
2. Demonstrate the nuances of language through group activities and oral presentations.
3. Build written communication skills to meet the needs of their academic and career endeavors.
4. Take part in interviews with confidence thereby enhancing their employability skills.
5. Choose appropriate language in their social and professional communication.

Subject Name: INTELLECTUAL PROPERTY RIGHTS Subject code: MC510

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. The course is designed to provide comprehensive knowledge to the students regarding Indian position of the Patent Law and importance of IPR .
2. Trademarks and designs with respect to products prevents entry into the market and ensures that consumers can rely on the quality and safety of genuine products.
3. To help the students to learn and understand the reason for pursuing the course and helps to identify what he will be able to do at the end of the course.
4. Trade secrets are secret practices and processes that give a company a competitive advantage over its competitors.
5. The primary function of intellectual property rights (IPRs) is to protect and stimulate the development and distribution of new products and the provision of new services based on the creation and exploitation of inventions, trademarks, designs, creative content or other intangible assets.



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Subject Name: Antennas and Propagation

Subject code: EC601PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply the radiation characteristics to thin linear wire antennas and loop antennas.
2. Analyze antenna arrays and measurement of antenna parameters.
3. Apply the characteristics of Yagi guda , Helical antennas and Horn antennas.
4. Analyze Microstrip and Reflector antennas parameters.
5. Categorize different phenomenon of Wave Propagation.

Subject Name: Digital Signal Processing

Subject code: EC602PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply the concepts of linear difference equations and Multi-rate digital signal processing on DTS.
2. Use DFT and FFT concepts to obtain frequency domain characteristics of DTS.
3. Analyze digital IIR filters by suitable design procedures.
4. Evaluate digital FIR filters by suitable design procedures.
5. Construction of Realization structures and Discuss finite word length effects.



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Subject Name: VLSI Design

Subject code: EC603PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply VLSI processing techniques and electrical properties of MOS circuits.
2. Apply Lamda rules to draw Layout of IC
3. Analysis alternative circuits for area, capacitance and delay of gates.
4. Evaluate data path and Array subsystems
5. Design Programmable Devices and learn the concepts of testing the CMOS circuits.

Subject Name: Embedded System Design

Subject code: EC613PE

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Compute the differences between the general computing system and the embedded system.
2. Choose the core and firm ware of the embedded system.
3. Analysis the programming environment and IDE's used to develop embedded system languages.
4. Categorize real time embedded systems using the concepts of RTOS.
5. Evaluate embedded system in RTOS.



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Subject Name: Digital Signal Processing Lab

Subject code: EC604PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply DFT and frequency response for given discrete time signal.
2. Analyze FFT and its computation complexity in comparison to DFT for given input sequence.
3. Analyze the concept of IIR digital filters.
4. Evaluate the concept of FIR digital filters.
5. Evaluate response of multi-rate signal processing for suitable desired specifications.

Subject Name: e – CAD Lab

Subject code: EC605PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Build digital circuits with HDL programming language
2. Construct combinational and sequential circuits with HDL programming language
3. Analyze any given circuits and compare them
4. Evaluate different layout of CMOS circuits
5. Compile Combinational and Sequential circuits on FPGA for any given specifications



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Subject Name: Scripting Languages Lab

Subject code: EC606PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Describe the knowledge of Ruby objects.
2. Understand the Experiments of Transaction Control Language
3. Acquire programming skills in Perl language.
4. Apply the Knowledge of programming using advanced perl concepts.
5. Apply the knowledge of application oriented programming.

Subject Name: Environmental Science

Subject code: MC609

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. The students able to know basic concept of ecological perspective and the value of the environment.
2. The students able to understand the significance of various natural resources and its management.
3. The students able to demonstrate a comprehensive understanding of the world's biodiversity and the importance of its conservation
4. The students able to identify different types of pollution and their control measures, Discover effective methods of waste management and come out with best possible solutions.
5. The students able to raise awareness about environmental laws and sustainable development.



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Subject Name: Microwave and Optical Communications Subject code: EC701PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply the power generation at microwave frequencies in the performance characteristics in microwave tubes.
2. Use the need of basic principles for solid state devices.
3. Distinguish between the different types of waveguide and ferrite components, and select proper components for engineering applications.
4. Analyze the properties of Scattering Matrix for various microwave junctions.
5. Discover the mechanism of light propagation through Optical Fibers.

Subject Name: Digital Image Processing

Subject code: EC713PE

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply different mathematical transforms on digital image.
2. Use Spatial and Frequency domain concepts for image Enhancement.
3. Analyze different image restoration techniques and color image processing.
4. Analyze various image Segmentation & Morphological image processing.
5. Elaborate different image compression techniques.



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Subject Name: Database Management Systems

Subject code: EC722PE

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Construct the E-R model to represent databases on real world problems.
2. Experiment with queries and nested queries on real world problems by using several operators like join, set, and aggregate.
3. Plan and Relate the concept of data planning and database design using normalization.
4. Utilize the ACID properties in transaction management and interpret concurrency control mechanisms.
5. Categorize various file organizations and indexing for faster retrieval of data, persistent storage of data.

Subject Name: Fundamentals of Biomedical Applications

Subject code: EC622OE

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Classify of different characteristics of medical instruments.
2. Apply the various ECG measurements like medical recorders for doctors to identify the heart related diseases.
3. Examine the how the blood pressure instruments measure the blood flow in the human body.
4. Analyze confidence in delivering effective therapeutic and diagnostic tools for doctors.
5. Develop concepts in cardiac and neuromuscular instrumentations.



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Subject Name: Professional Practice, Law & Ethics

Subject code: SM702MS

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Understand the importance of professional practice to ease the business.
2. Law and ethics makes are to coordinate in personal and professional careers.
3. To understand the rights and responsibilities as an employee.
4. To apply labour laws to follow the policies of an organization.
5. To develop ideas of legal and practical aspects of the profession.

Subject Name: Microwave and Optical Communications Lab

Subject code: EC703PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Analyze the characteristics of microwave tubes.
2. Analyze the characteristics of simple microwave circuits like couplers, power dividers and hybrid ring.
3. Calculate different microwave parameters including guide wavelength, VSWR, unknown impedance and reflection coefficient.
4. Analyze the characteristics of Gunn diode and the output power obtained.
5. Analyze the characteristics of light propagation through Optical fibers.



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Subject Name: Industrial Oriented Mini Project/ Summer Internship

Subject code: EC704PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Interpret various technologies and fields for projects.
2. Distinguish technologies and discuss with the team to solve issues in different fields.
3. Design software/hardware to address issue in a field.
4. Justify the performance of the mini project work with appropriate communication skills and technical knowledge.
5. Develop solutions for issues that are unaddressed using modern tools for feasible project.

Subject Name: Seminar

Subject code: EC705PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Spell for basic concepts of science and technology.
2. Contrast the understanding perceptive of techniques applicable to their domain.
3. Construct the solutions upon their own knowledge.
4. Improve their Presentation and Communication skills.
5. Make up them to pursue their placements and higher studies.



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Subject Name: Project Stage – I

Subject code: EC706PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply engineering knowledge gained in solving real life problems.
2. Analyze various methodologies and technologies and discuss with the team for solving the problem.
3. Design an electronic application with specified needs using hardware-software interfacing.
4. Evaluate application of project work with appropriate societal consideration.
5. Develop solutions for contemporary problems using modern tools for sustainable development.

Subject Name: Wireless Sensor Networks

Subject code: EC813PE

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Use network concepts for wireless sensor networks.
2. Apply enabling technologies for wireless sensor networks.
3. Classify the MAC & routing protocols of wireless networks.
4. Distinguish various data dissemination methods and protocols used in sensor networks.
5. Select various components to implement a wireless sensor network.



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Subject Name: System on Chip Architecture

Subject code: EC821PE

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Applying the features for architectural design on SOCA.
2. Selecting the processors on the basis of criteria and limitations.
3. Designing the memory architectures for SOCA.
4. Analyze the interconnect strategies and their customization on SOC.
5. Constructing the different customizations.

Subject Name: Fundamentals of Robotics

Subject code: EC733OE

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply knowledge of industrial robots, characteristics, end effectors and actuators.
2. Apply spatial transformation to obtain forward and inverse kinematics.
3. Analyze forces in links and joints of a robot.
4. Determine working principle of various sensors and program different operations.
5. Develop applications of robots in industry.



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Subject Name: Project Stage - II

Subject code: EC801PC

Course Outcomes:

Upon the completion of the course, the students will be able to:

1. Apply engineering knowledge gained in solving real life problems.
2. Analyze various methodologies and technologies and discuss with the team for solving the problem.
3. Design an electronic application with specified needs using hardware-software interfacing.
4. Evaluate application of project work with appropriate societal consideration.
5. Develop solutions for contemporary problems using modern tools for sustainable development.