



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

2020-21

Subject Name: **MATHEMATICS – I**

Subject code: 20MA1BS01

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: **PROGRAMMING FOR PROBLEM SOLVING**

Subject code: **20CS1ES01**

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, strings, structures and pointers to find the solution for the 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, sorting techniques along with the complex city analysis.



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Subject Name: **ENGINEERING GRAPHICS**

Subject code: **20ME1ES02**

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 inter sections of solids in real time situation.
5. Develop isometric and orthographic views of the objects.

Subject Name: **APPLIED PHYSICS**

Subject code: **20AP1BS02**

Course Outcomes:

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

1. Design various electronic circuits using fundamentals of Semiconductor physics.
2. Design various electronic circuits using fundamentals of Semiconductor physics.
3. Apply the concepts of optoelectronics in various op to electronic devices.
4. Apply the learned knowledge of laser and fiber optics in communication systems.
5. Analyze various magnetic and electromagnetic properties applicable in magnetic materials.



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Subject Name: **PROGRAMMING FOR PROBLEM SOLVING LAB** Subject code: **20CS1ES03**

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.

Subject Name: **APPLIED PHYSICS LAB**

Subject code: **20AP1BS03**

Course Outcomes:

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

1. Compute the (V-I/P-I) characteristics of LED, LASER, and Solar cell.
2. Calculate the energy gap of semiconductor diode.
3. Interpret the theory of Hall effect with experiment by determining the Hall coefficient.
4. Examine the bending losses for different Optical fiber Cables.
5. Construct various circuits –Resonance, Time constant and Magnetic field using LCR, RC, Stewart and Gees circuits.



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Subject Name: **ENVIRONMENTAL SCIENCE**

Subject code: **20MC1ES04**

Course Outcomes:

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

1. Explain the concept of ecological perspective and the value of the environment.
2. Value the significance of various natural resources and its management.
3. Demonstrate a comprehensive understanding of the world's biodiversity and the importance of its conservation.
4. Identify different types of pollution and their control measures, effective methods of waste management with best possible solutions.
5. Develop an awareness about environmental laws and sustainable development.

Subject Name: **MATHEMATICS – II**

Subject code: **20MA2BS04**

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 Centre 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: **20CH2BS05**

Course Outcomes:

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

1. Analyze microscopic chemistry in terms of atomic and molecular orbitals and intermolecular.
2. Measure various parameters of water and its significance in industrial and domestic purpose.
3. Make use of essential aspects of Electro chemistry and Corrosion in industry.
4. Explain stereochemistry and synthetic aspects useful for understanding reaction pathways.
5. Apply the basic principles of various Spectroscopic techniques in chemical industry and medical field.

Subject Name: **BASIC ELECTRICAL ENGINEERING**

Subject code: **20EE2ES05**

Course Outcomes:

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

1. Solve electrical circuits using basic network laws and theorems.
2. Apply the concept of AC Circuit parameters and its effect on resonance.
3. Explain the operation of Transformers and its applications.
4. Construct the DC and AC machines and its working principles
5. Interpret the components of LT Switchgear and installations



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Subject Name: **ENGLISH**

Subject code: **20EN2HS01**

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.

Subject Name: **ENGINEERING WORKSHOP**

Subject code: **20ME2ES06**

Course Outcomes:

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

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



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Subject Name: **ENGINEERING CHEMISTRY LAB**

Subject code: **20CH2BS06**

Course Outcomes:

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

1. An ability to Analyze the quality of water by determining its chemical parameters.
2. The synthesis of common drugs like Paracetamol and Aspirin.
3. Determination of rate constant of a reaction from concentration – time relationships.
4. Determination of physical properties like adsorption and viscosity of lubricants.
5. Estimation of different types of qualitative and quantitative measurements of a given Problem.

Subject Name: **ENGLISH LANGUAGE COMMUNICATION SKILLS LAB** Subject code: **20EN2HS02**

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: **20EE2ES07**

Course Outcomes:

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

1. Explain the basic electrical laws.
2. Produce the response in different types of electrical circuits to different excitations.
3. Analyze the response of electrical circuits under resonance condition.
4. Calculate the measuring parameters and relation between the basic electrical parameters.
5. Evaluate the basic characteristics of transformers and electrical machines.

Subject Name: **ELECTRONIC DEVICES AND CIRCUITS**

Subject code: **20EC3PC01**

Course Outcomes:

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

1. Apply the Characteristics of different Practical Diodes.
2. Choose PN Junction Diode as a Rectifier, Clippers, Clampers and Sampling Gates.
3. Analyze the Characteristics of Transistor Configurations and its Biasing.
4. Evaluate the Characteristics of JFET and its Biasing.
5. Design the MOSFET as an Inverter.



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Subject Name: **NETWORK ANALYSIS AND TRANSMISSION LINES** Subject code: **20EC3PC02**

Course Outcomes:

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

1. Calculate transient and steady state responses of RLC circuits.
2. Relate two-port network parameters and attenuators.
3. Evaluate the transmission line parameters and characteristics.
4. Design transmission lines of various lengths using smith chart configuration.

Subject Name: **SWITCHING THEORY AND LOGIC DESIGN** Subject code: **20EC3PC03**

Course Outcomes:

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

1. Apply the concept of Boolean algebra to simplify SOP and POS Boolean functions.
2. Construct combinational logical circuits using K-map method..
3. Differentiate Combinational and Sequential logical circuits.
4. Evaluate Synchronous and Asynchronous Sequential circuits.
5. Design a Finite state machine using Moore and Mealy Machines.



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Subject Name: **SIGNALS AND SYSTEMS**

Subject code: **20EC3PC04**

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. Demonstrate 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 a given system using concept of sampling theorem and correlation.

Subject Name: **PROBABILITY THEORY AND STOCHASTIC PROCESSES**

Subject code: **20EC3ES08**

Course Outcomes:

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

1. Apply the concepts of probability and random variable to find probability density function.
2. Use the concepts of operations of random variable on given single and multiple random variables.
3. Analyze the concepts of temporal characteristics of a random process.
4. Evaluate the spectral density of a given random process.
5. Design a noise free communication system by implementing the concepts of linear system responses & SNR.



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Subject Name: **ELECTRONIC DEVICES AND CIRCUITS LAB**

Subject code: **20EC3PC05**

Course Outcomes:

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

1. Apply the Characteristics of various Practical Diodes.
2. Connect PN Junction Diode to form a Rectifier and Filter circuits
3. Test different types of Clippers and Clampers using PN Junction Diodes.
4. Develop circuits to verify characteristics of Transistor configurations.
5. Evaluate the characteristics of JFET.

Subject Name: **SWITCHING THEORY AND LOGIC DESIGN LAB**

Subject code: **20EC3PC06**

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



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Subject Name: **BASIC SIMULATION LAB**

Subject code: **20EC3ES09**

Course Outcomes:

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

1. To Understand and Practice the Problems on Ages.
2. To Understand and Practice the Quadratic Equations.
3. To Understand and Practice arrangement and selection in their daily life.
4. To Understand and Practice commercial mathematics.

Subject Name: **PROFESSIONAL ENGINEERING ETHICS**

Subject code: **20MC3HS01**

Course Outcomes:

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

1. Apply Professional Ethics in Accountabilities.
2. Choose ethical and Morals principles.
3. Analyze Professional Practices.
4. Support Work Place Rights and Responsibilities.
5. Discuss in Global issues in Professional Ethics.



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Subject Name: **QUANTITATIVE APTITUDE**

Subject code: **20MC3BS02**

Course Outcomes:

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

1. To Understand and Practice Simplifications.
2. To Understand and Practice the Problems on Ages.
3. To Understand and Practice the Quadratic Equations.
4. To Understand and Practice arrangement and selection in their daily life.
5. To Understand and Practice commercial mathematics.

Subject Name: **ANALOG AND DIGITAL COMMUNICATIONS**

Subject code: **20EC4PC07**

Course Outcomes:

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

1. Apply Amplitude Modulation and Demodulation techniques in Communication System.
2. Use the concepts of Angle Modulation in communication system.
3. Analyze the working principle of analog transmitters and receivers.
4. Summarize the different pulse code modulation techniques.
5. Formulate error control codes and various modulation schemes in digital communication system



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Subject Name: **ELECTROMAGNETIC FIELDS AND WAVES**

Subject code: **20EC4PC08**

Course Outcomes:

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

1. Apply basic laws of Electrostatics.
2. Use the concepts of Magnetostatics.
3. Deduce Maxwell's equations for static and dynamic fields.
4. Evaluate Uniform plane wave characteristics for different media.
5. Formulate wave characteristics for different angle of incidences and derive poynting theorem.

Subject Name: **ANALOG AND PULSE CIRCUITS**

Subject code: **20EC4PC09**

Course Outcomes:

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

1. Construct the single stage and Multistage Amplifiers to find frequency response of BJT Amplifiers.
2. Sketch the response of JFET Amplifiers at high frequencies.
3. Distinguish Feedback Amplifiers and Oscillators using BJT Transistors.
4. Compare different Power and Tuned amplifiers for Audio and Radio applications.
5. Design Multivibrators and Sweep circuits for various applications.



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Subject Name: **NUMERICAL METHODS AND COMPLEX VARIABLES** Subject code: **20MA4BS07**

Course Outcomes:

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

1. Estimate the value for the given data using interpolation.
2. Find the numerical solutions for a given ODE's.
3. Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems.
4. Apply Taylor's and Laurent's series expansions of complex Function.
5. Explain the transformations on different planes.

Subject Name: **LINEAR IC APPLICATIONS**

Subject code: **20EC4PC10**

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. Interpret applications of IC 555 and IC 565.
5. Design ADC and DAC circuits.



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Subject Name: **Analog and Digital Communications Lab**

Subject code: **20EC4PC11**

Course Outcomes:

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

1. Demonstrate the effect of negative feedback on the frequency response of Feedback Amplifiers.
2. Calculate operating frequency of RC and LC Oscillators.
3. Analyze the frequency response of Multistage Amplifiers.
4. Evaluate response of Multivibrators and Sweep circuits.
5. Simulate analog circuits for any given parameters using Multisim Software.

Subject Name: **ANALOG AND PULSE CIRCUITS LAB**

Subject code: **20EC4PC12**

Course Outcomes:

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

1. Simulate the electronic circuits using Multisim Software.
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. Determine the frequency of Oscillations for RC and LC oscillators.
5. Design the Multivibrators and Sweep Circuits.



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Subject Name: **IC APPLICATIONS LAB**

Subject code: **20EC4PC13**

Course Outcomes:

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

1. Construct the various linear and Non-linear circuits of op amp.
2. Sketch the frequency response of low pass and high pass filters for specified pass band gain.
3. Compare characteristics of voltage regulators.
4. Evaluate parameters of multivibrators using IC555.
5. Design PLL using IC 565 for various applications.

Subject Name: **GENDER SENSITIZATION LAB**

Subject code: **20MC4HS03**

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.



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Subject Name: **QUANTITATIVE LOGICAL AND REASONING**

Subject code: **20MC4BS03**

Course Outcomes:

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

1. To understand and practice logical reasoning
2. To understand and practice the different classifications
3. To understand and practice different Sitting Arrangements, Data Sequences.
4. To understand and practice the Non-Verbal Reasoning.
5. To understand and practice the graphs.



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Subject Name: **BUSINESS ECONOMICS & FINANCIAL ANALYSIS** Subject code: **20MS5HS03**

Course Outcomes:

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

1. Illustrate business and economics in small firms and companies.
2. Apply supply forecast based on demand.
3. Analyze Production, Cost, Market Structures & Pricing
4. Evaluate the principles of accounting to record, classify and summarize various transactions in books of accounts for preparation of final accounts.
5. Formulate fundamental accounting concepts and Ratio analysis.

Subject Name: **ANTENNA AND WAVE PROPAGATION**

Subject code: **20EC5PC14**

Course Outcomes:

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

1. Discover antennas based on frequency and establish radiation patterns of the antennas.
2. Demonstrate antenna arrays and various antenna measurement methods.
3. Explain the design consideration of VHF, UHF and microwave antennas.
4. Evaluate the performance of Microstrip and Reflector antennas.
5. Investigate mechanisms and characteristic features of different wave propagations.



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Subject Name: **COMPUTER NETWORKS**

Subject code: **20EC5PC15**

Course Outcomes:

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

1. Demonstrate network models, network types and transmission media.
2. Illustrate Data link layer Protocols
3. Compare the Virtual Vs datagram networks, Ipv4 Vs Ipv6 and various routing protocols.
4. Determine the connection oriented, connectionless and web application services.
5. Test a wireless network using IEEE standards.

Subject Name: **MICROPROCESSORS AND MICROCONTROLLERS** Subject code: **20EC5PC16**

Course Outcomes:

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

1. Apply the concept of addressing modes and data transfer instructions of 8086 microprocessors for Arithmetic and Logical Unit Operation.
2. Analyze the concepts of internal architecture, organization of 8051 to solve real time applications.
3. Analyze various interfacing devices with 8051 microcontrollers.
4. Evaluate simple programs using Assembly Language Program of ARM and their instruction formats.
5. Explain the architecture of Advanced ARM Processors.



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Subject Name: **COMPUTER NETWORKS LAB**

Subject code: **20EC5PC17**

Course Outcomes:

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

1. Demonstrate network models, network types and transmission media.
2. Illustrate Data link layer Protocols.
3. Compare the Virtual Vs datagram networks, Ipv4 Vs Ipv6 and various routing protocols.
4. Determine the connection oriented, connectionless and web application services.
5. Test a wireless network using IEEE standards.

Subject Name: **Microprocessors and Microcontrollers Lab**

Subject code: **20EC5PC18**

Course Outcomes:

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

1. Demonstrate the concept of addressing in 8086 for arithmetic, logical, string and bit level operations.
2. Experiment the concept of arithmetic, logical, bit manipulation and branching instructions using 8051 microcontrollers.
3. Analyze the serial and parallel communication in 8051 Microcontroller.
4. Design the given system using interrupt controller in 8051 microcontrollers.
5. Build 8051 microcontroller with input and output devices.



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Subject Name: **ADVANCED COMMUNICATION SKILLS LAB**

Subject code: **20EN5HS04**

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 endeavours.
4. Take part in interviews with confidence thereby enhancing their employability skills.

Subject Name: **INTELLECTUAL PROPERTY RIGHTS**

Subject code: **20EN5HS05**

Course Outcomes:

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

1. Use intellectual property by interpreting various rights ensured by IPR to the intellectuals.
2. Demonstrate various processes involved in acquiring trademarks.
3. Distinguish the features of copyrights and patterns.
4. Explain the laws and the extent they protect trade secrets.
5. Discuss new developments of intellectual property.



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Subject Name: **PERSONALITY DEVELOPMENT AND SOFT SKILLS** Subject code: **20MC5HS06**

Course Outcomes:

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

1. Students will possess the personality development techniques and communication skills.
2. Students will possess knowledge about leadership.
3. Students will be able to acquire the skills to manage stress and conflict.
4. Students will able to acquire Problem Solving & Critical Thinking.
5. Students will able to acquire different resume preparation & Essay Writing Techniques

Subject Name: **COMPUTER ORGANIZATION AND OPERATING SYSTEMS**

Subject code: **20EC5PE11**

Course Outcomes:

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

1. Sketch the basic structure of a digital computer.
2. Sketch the Arithmetic operations of binary number system.
3. Identify the organization of the Control Unit, Arithmetic and Logical Unit, Memory Unit .
4. Illustrate the design of Memory unit and overview of Principles of Deadlock.
5. Compile the major activities of OS with regard to file management



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Subject Name: **CONTROL SYSTEMS**

Subject code: **20EC6PC19**

Course Outcomes:

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

1. Apply the dynamics of Control System and Obtain its Transfer Function.
2. Demonstrate system performance and assess its Stability in time domain.
3. Analyze Stability of Control System in frequency domain through various techniques.
4. Evaluate different controllers by Root Loci, Bode plot method etc.
5. Test systems through State Space Representation.

Subject Name: **DIGITAL SIGNAL PROCESSING**

Subject code: **20EC6PC20**

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 given DTS.
2. Use DFT and FFT concepts to obtain frequency domain characteristics of a given DTS.
3. Analyze analog and digital IIR filters for given specifications.
4. Evaluate analog and digital FIR filters for the given specifications.



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Subject Name: **VLSI DESIGN**

Subject code: **20EC6PC21**

Course Outcomes:

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

Course outcomes Upon completing this course, the student will be able to

1. Apply VLSI processing techniques and calculate electrical properties of MOS circuits.
2. Apply Lamda –rules to draw layout of IC's.
3. Analyze alternate circuits to find area, capacitance and delay of gates.
4. Evaluate data path and array subsystems
5. Design programmable logic devices and test CMOS.

Subject Name: **DIGITAL SIGNAL PROCESSING LAB**

Subject code: **20EC6PC22**

Course Outcomes:

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

1. Apply DFT on a given discrete time signals to obtain their characteristics.
2. Utilize FFT & DFT on a given signal & interpret the complexity.
3. Analyze IIR through Butterworth and Chebyshe filter techniques.
4. Evaluate FIR for LP and HP by windowing techniques.
5. Simulate Multi-rate signal processor response for given specifications in MATLAB 2020



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Subject Name: **E-CAD LAB**

Subject code: **20EC6PC23**

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 in HDL and verify their performance.
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.

Subject Name: **Python Programming LAB**

Subject code: **20EC6PC24**

Course Outcomes:

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

1. Apply basic concepts and the contributions of scripting language
2. Experiment the object-oriented concepts and built-in objects of Python.
3. Examine practically and contemporary applications in TCP/IP network programming.
4. Determine various mathematical solutions.
5. Test various functions and inputs to sort them based on given requirements



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Subject Name: **EMBEDDED SYSTEM DESIGN**

Subject code: **20EC6PE22**

Course Outcomes:

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

1. Apply various Embedded system attributes different applications.
2. Use suitable hardware and interfacing components in Embedded Systems.
3. Differentiate Embedded circuits and Firmware methods.
4. Explain the basic concepts of Real Time operating systems.
5. Summarize concept of Task communication and synchronization in RTOS.

Subject Name: **PRINCIPLES OF ELECTRONIC COMMUNICATIONS** Subject code: **20EC6OE11**

Course Outcomes:

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

1. Use the concepts of modulation in calculating various parameters.
2. Apply different modulation and demodulation techniques in suitable application
3. Describe operations of telecommunication systems in different area networks
4. Recognize the use of satellite communications
5. Analyze Different technologies in cellular and mobile communications



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Subject Name: **MICROWAVE ENGINEERING**

Subject code: **20EC7PC25**

Course Outcomes:

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

1. Apply the concepts of Maxwell's equations and derive performance characteristics of rectangular wave guides and cavity resonators.
2. Demonstrate types, structures and characteristics of microwave tubes.
3. Analyze structure and operational characteristics of Helix and M-type tubes
4. Select various waveguide components for different microwave applications and Evaluate their S-parameters.
5. Construct test bench using microwave tubes and solid-state devices to measure various signal characteristics.

Subject Name: **FUNDAMENTALS OF MANAGEMENT FOR ENGINEERS**

Subject code: **20SM7MS02**

Course Outcomes:

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

1. Apply various managerial approaches to learn managerial skills.
2. Use creativity and innovation in managerial work.
3. Differentiate the principles of organization.
4. Evaluate motivational theory.
5. Develop effective controls.



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Subject Name: **MICROWAVE ENGINEERING LAB**

Subject code: **20EC7PC26**

Course Outcomes:

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

1. Calculate the performance characteristics of microwave tube.
2. Sketch square wave modulation by applying Gunn diode characteristics.
3. Analyze the scattering parameter for various microwave junction..
4. Evaluate different parameter of a waveguide.
5. Investigate radiation pattern of Horn antenna.

Subject Name: **WIRELESS SENSOR NETWORKS**

Subject code: **20EC7PE32**

Course Outcomes:

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

1. Choose Wireless Sensor Networks for various scenarios considering their constraints and challenges
2. Utilize MANETS and enabling technologies for wireless sensor networks optimally
3. Explain routing, MAC, LR-WPAN and ZigBee protocols
4. Analyze data dissemination, gathering and fusion etc., in a
5. Develop Wireless Sensor Network for different applications considering various design principles and constraints



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Subject Name: **BIO MEDICAL ELECTRONICS**

Subject code: **20EC7PE43**

Course Outcomes:

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

1. Apply Bio potential signals and their characteristics in different types of Electrodes.
2. Utilize various electrodes and recording Cardiovascular measurement.
3. Analyze working principles of various Neurological Instruments.
4. Evaluate different critical care equipment.
5. Discuss the principles of Instruments in medical imaging.

Subject Name: **IoT and Its APPLICATIONS**

Subject code: **20EC8PE51**

Course Outcomes:

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

1. Identify the basics of IoT.
2. Implement the state of the Architecture of an IoT.
3. Design methodology and hardware platforms involved in IoT.
4. Analyze and organize the data for cloud platform.
5. Compare IOT Applications in Industrial & real world.



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Subject Name: **ARTIFICIAL INTELLIGENCE**

Subject code: **20EC8PE62**

Course Outcomes:

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

1. Ability to formulate an efficient problem space, expressed in natural language.
2. Select a search algorithm for a problem and estimate its time and space complexities.
3. Possess the skill for representing knowledge using the appropriate technique for a given problem.
4. Apply AI techniques to solve problems of game playing, and machine learning.
5. Acquire the knowledge on machine learning techniques.