R18

JYOTHISHMATHI INSTITUTE OF TECHNOLOGY & SCIENCE
Approved by AICTE,New Delhi and Affiliated to JNTU, Hyderabad
Accredited with NAAC "A" Grade
(An ISO 9001:2015 Certified Institution)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

I YEAR/I-SEMESTER

C101	MA101BS	Mathematics-I	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C101.1	Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations
C101.2	Find the Eigen values and Eigen vectors and reduce the quadratic form to canonical form by orthogonal transformations.
C101.3	Analyze the nature of sequence and series.
C101.4	Solve the applications on the mean value theorems and evaluate the improper integrals using Beta and Gamma functions
C101.5	Find the extreme values of functions of two variables with/ without constraints.

C102	AP202BS	Applied Physics	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C102.1	Understand the fundamental concepts on Quantum behavior of matter in its micro state.
C102.2	Apply fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre optics concepts to various systems like communications, solar cell, photo cells.
C102.3	Design, characterization and study of properties of materials.
C102.4	Understand the phenomena of electromagnetism, magnetic materials and dielectric materials.
C102.5	Understand various aspects of nano materials.

C103	CS103ES	Programming for Problem Solving	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C103.1	Understand the basic s of computers, algorithms and flowcharts for computer problems
C103.2	Apply different types of control structures in computer programming
C103.3	Develop programs that make use of concepts such as arrays, pointers, strings, structures and files
C103.4	Develop programs using modular approach
C103.5	Solve searching and sorting problems

C104	ME104ES	Engineering Graphics	1-0-4 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C104.1	Understand basic engineering drawing standards and curves.
C104.2	Understand the system of projection with respect to the reference planes of various objects.
C104.3	Construct the internal details of cut section models.
C104.4	Build the development of solid surfaces.
C104.5	Design the 3D isometric view from the 2D orthographic views and vice versa.

C105	AP105BS	Applied Physics Lab	0-0-3 (L-T-P)	1.5 Credits

Course outcomes: At the end of the course, the student will be able to:

C105.1	Learn the fundamental concepts on electronic devices like L.C.R, R.C, L.E.Detc
C105.2	Fundamentals of electric nature enable the students to applying varies areas like Hall effect, photo electric effect.
C105.3	Exposed to the phenomenon of electromagnetism, photo voltaic effect in daily life.
C105.4	Identify the type of semiconductor by finding energy gap value.
C105.5	Gain the knowledge about the bending losses of optical fiber.

C106	CS106ES	Programming for Problem Solving Lab	0-0-3 (L-T-P)	1.5 Credits

Course outcomes: At the end of the course, the student will be able to:

C106.1	Write the algorithms and draw flowcharts for solving Mathematical and Engineering problems.
C106.2	Apply data types and operators in data processing applications.
C106.3	Design and develop Computer programs using decision making statements, iteration, function and recursion.
C106.4	Demonstrate an understanding of computer programming language concepts using array and structures.
C106.5	Implement Computer programs, analyzes, and interprets the concept of pointers and file handling and their usage.

C107	*MC209ES	Environmental Science	3-0-0 (L-T-P)	0 Credits

Course outcomes: At the end of the course, the student will be able to:

C107.1	Gain knowledge about environment and ecosystem.
C107.2	Students will learn about natural resource, its importance and environmental impacts of Human activities on natural resource.
C107.3	Gain knowledge about the conservation of biodiversity and its importance.
C107.4	Aware students about problems of environmental pollution, its impact on human and Ecosystem and control measures.
C107.5	Students will learn about increase in population growth and importance of the acts.

I YEAR/II-SEMESTER

C108	MA201BS	Mathematics – II	3-1-0 (L-T-P)	4 Credits

Course outcomes:

C108.1	Identify whether the given differential equation of first order is exact or not.
C108.2	Apply the concept of higher differential equation to real World problems.
C108.3	Evaluate the multiple integrals and apply the concept to find areas volumes.
C108.4	Understand the importance of vector operators and their physical significance
C108.5	Evaluate the line, surface and volume integrals and converting them from one to another.

C109	CH202BS	Chemistry	3-1-0 (L-T-P)	4 Credits

Course outcomes:

C109.1	The concept of molecular and atomic orbital's and band theory related to conductivity
C109.2	Application of different methods to convert hard water into soft water
C109.3	Apply the electrochemistry concept to control corrosion process
C109.4	Analysis of reaction mechanism of organic molecules and synthesis drug molecules
C109.5	Application of basic techniques of spectroscopy in medical and other field

C110	EE203ES	Basic Electrical Engineering	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C110.1	Apply the concepts of KVL/KCL and network theorems in solving DC circuits.
C110.2	Understand and Analyze the AC fundamentals, AC circuits, phase relation and quality factor
C110.3	Identify the application areas of a single phase two winding transformer as well as an auto transformer and calculate their efficiency. Also identify the connections of a three phase transformer.
C110.4	Illustrate the working principles of induction motor, synchronous machine as well as DC machine and employ them in different area of applications.
C110.5	Describe the components of low voltage electrical installations and perform elementary calculations for energy consumption.

C111	ME205ES	Engineering Workshop	1-0-3 (L-T-P)	2.5 Credits

Course outcomes: At the end of the course, the student will be able to:

C111.1	Apply suitable tools for preparing different components of engineering processes, including material removal, measuring, chiseling fitting, and carpentry experiments.
C111.2	Students are able to build tin metal parts in real-world applications.
C111.3	Practice on tools in foundry, able to understand the properties of mould making
C111.4	Apply basic electrical engineering knowledge to house wiring practice
C111.5	Practice in fabrication of components using methods like welding and black smithy.

C112	EN205HS	English	2-0-0 (L-T-P)	2 Credits

Course outcomes: At the end of the course, the student will be able to:

C112.1	Better understanding of nuances of English language through audio –visual experience &group activities
C112.2	Classify the given texts and respond appropriately
C112.3	Illustrate confidently in various contexts and different cultures
C112.4	Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills
C112.5	Analyse the language emphasis on vocabulary and grammar

C113	CH206BS	Engineering Chemistry Lab	0-0-3 (L-T-P)	2 Credits

Course outcomes: At the end of the course, the student will be able to:

C113.1	Determination of parameters like hardness and chloride content in water
C113.2	Estimation of rate constant of reaction from concentration –time relationship
C113.3	Determination of physical properties like adsorption and viscosity
C113.4	Calculation of R_f values of some organic molecules by TLC technique
C113.5	Able to perform methods such as conductometry and potentiometry in order to find out concentration of acids and bases

C114	EN207HS	English Language and Communication Skills Lab	0-0-2 (L-T-P)	1 Credits

Course outcomes:

C114.1	Better understanding of nuances of English language through audio –visual experience &group activities
C114.2	Neutralization of accent for intelligibility
C114.3	Speaking skills with clarity & confidence which in turn enhances their employability skills
C114.4	Personality traits like decision making, problem solving & leadership qualities
C114.5	Development of conversation skills

C115	EE208ES	Basic Electrical Engineering Lab	0-0-2 (L-T-P)	1 Credits

Course outcomes: The candidate is expected to be able to:

C115.1	Illustrate the application of KVL/KCL and network theorems to DC electrical circuits.
C115.2	Analyze the power factor and measure power of single phase and three phase AC electrical circuits.
C115.3	Demonstrate the behavior of a single-phase AC series resonant circuit.
C115.4	Calculate efficiency of a single-phase transformer and DC machine.
C115.5	Demonstrate speed measurement and speed reversal of three phase induction motor and identify the type of DC and AC machines based on their construction.

II YEAR/I-SEMESTER

C201	EC301PC	Electronic Devices and Circuits	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C201.1	Understand the Operation of PN Junction diode and Design rectifiers, clippers, clampers using diodes.
C201.2	Analyze transistor parameters for configuration including CE, CB, and CC.
C201.3	Analyze the operation of FET & special purpose devices - Zener diode, SCR, Tunnel diode, UJT, Varactor diode.
C201.4	Design of small signal low frequency BJT amplifiers.
C201.5	Analyze the JFET Amplifier and MOSFET Amplifiers.

C202	EC302PC	Network Analysis and Transmission Lines	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C202.1	Gain the knowledge on basic Network topology and Magnetic coupled circuits
C202.2	Analyze the Steady state and transient analysis of RC, RL and RLC Circuits.
C202.3	Know the characteristics of two port network parameters and their applications to Electronic circuit simplification.
C202.4	Analyze the transmission line parameters and configurations to find the conditions for distortion less transmission of electric signals.
C202.5	Determine the transmission line Impedance and Reflection coefficient anddesign the single stub matching using Smith chart procedure

C203	EC303PC	Digital System Design	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C203.1	Understand the numerical information in different forms and Boolean Algebra theorems, operation of Logic gates.
C203.2	Apply the Karnaugh map to minimize combinational logic functions and to Design various combinational logic circuits like Adders, Subtractors, Multiplexers, Encoders, and Decoders etc.
C203.3	Design sequential circuits like flip flops, registers and counters.
C203.4	Design and analyze the circuits using Finite state machines and minimization of state machines.
C203.5	Understand the logic families and realization of logic gates using discrete components.

C204	EC304PC	Signals and Systems	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C204.1	Represent any arbitrary signals in terms of complete sets of orthogonal functions and understands the principles of impulse functions, step function and signum function.

C204.2	Express periodic signals and non-periodic signals in terms of Fourier transform and representation of the spectrum and to design a system for sampling a signal.
C204.3	Understand the principle of linear system, filter characteristics of a system and its band width
C204.4	Find Laplace transform and Z-transform of various signals and response of the system using Laplace transform and Z-transform.
C204.5	Understand the concepts of sampling theorem, auto correlation, cross correlation and power Density Spectrum.

C205	EC305PC	Probability Theory and Stochastic Processes	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C205.1	Ability to apply knowledge of mathematics, probability and engineering in communication based system design
C205.2	Designs and conduct experiments related to communication system design and to analyze their outcomes.
C205.3	Simulates & debug and test a Digital and analog communication system.
C205.4	Ability to identify, formulate, and solves engineering problems in communication based system design.
C205.5	Ability to use design tools for communication system design, test and evaluation.

C206	EC306PC	Electronic Devices and Circuits Lab	0-0-2 (L-T-P)	1 Credits

Course outcomes: At the end of the course, the student will be able to:

C206.1	Analyze the diode and transistor characteristics.
C206.2	Understand the principles of rectifier circuits using diodes and implement them using hardware.
C206.3	Understand the concepts of unipolar junction transistor and observe its characteristics.
C206.4	Design various amplifiers like CE, CC and common source FET amplifiers and implement them using hardware and also observe their frequency responses
C206.5	Design various types of Clippers and Clampers at different reference voltages

C207	EC307PC	Digital System Design Lab	0-0-2 (L-T-P)	1 Credits

Course outcomes: At the end of the course, the student will be able to:

C207.1	Understand the numerical information in different forms and Boolean Algebra theorems, operation of Logic gates
C207.2	Apply the Karnaugh map to minimize combinational logic functions and to Design various combinational logic circuits like Adders, Subtractors, Multiplexers, Encoders, Decoders etc.
C207.3	Design sequential circuits like flip flops and registers
C207.4	Design Synchronous and Asynchronous counter using flip-flops
C207.5	Understand the logic families and realization of logic gates using discrete components.

C208	EC308PC	Basic Simulation Lab	0-0-2 (L-T-P)	1 Credits

Course outcomes: At the end of the course, the student will be able to:

C208.1	Ability to Understand Basic Operations on Matrices
C208.2	Ability to Understand the Generation of Various Signals and Sequences (Periodic and Aperiodic).
C208.3	Ability to Understand Auto Correlation and Cross Correlation between Signals and Sequences and Verification of Linearity and Time Invariance Properties of a given Continuous/Discrete System.
C208.4	Understand the Waveform Synthesis and plotting the Pole-Zero maps in S-plane and Z-Plane for the given transfer function
C208.5	Ability to Know the Fourier Transform of a given signal and plotting its magnitude and phase spectrum.

II YEAR/II-SEMESTER

C209	MA401BS	Laplace Transforms, Numerical Methods &Complex Variables	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C209.1	Application of ODE's by Laplace transformation techniques.
C209.2	Understanding the real root of the equation.
C209.3	Investigate the value for the given data by interpolation.
C209.4	Analyze the complex function with reference to their analyticity, integration using Residues.
C209.5	Develop the Taylor's and Laurent's expansions of complex Function.

C210	EC402PC	Electromagnetic Fields and Waves	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C210.1	Apply knowledge of Basic Laws, Concepts and proofs related to Electrostatic Fields and Magneto static Fields.
C210.2	To solve the energy problems on static and time varying electro static fields by using Maxwell equations and boundary condition.
C210.3	Analyze the Wave Equations for good conductors and good dielectrics, and evaluate the UPW Characteristics for several practical media of interest
C210.4	Establish the proof and estimate the polarization features, reflection and transmission coefficients for UPW propagation, distinguish between Brewster and Critical Angles, and acquire knowledge of their applications
C210.5	To analyses completely the rectangular wave guides, their mode characteristics and design wave guides for solving practical problems

C211	EC403PC	Analog and Digital Communications	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C211.1	Analyze and design of various continuous wave and angle modulation and demodulation techniques.
C211.2	Apply the Karnaugh map to minimize combinational logic functions and to Design various combinational logic circuits like Adders, Subtractors, Multiplexers, Encoders, and Decoders etc.
C211.3	Attain the knowledge about AM,FM Transmitters and Receivers
C211.4	Analyze and design the various pulse modulation Techniques
C211.5	Understand the concept of Digital Modulation Techniques and Baseband Transmission.

C212	EC404PC	Linear IC Applications	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C212.1	Analyze important types of integrated circuits and characteristics of OP-Amps.
C212.2	Analyze linear and non-linear applications using op-amps
C212.3	Design different types of active filters, oscillators and waveform generators.
C212.4	Analyze the 555 timers, PLL and their applications in electrical and electronics Circuits.
C212.5	Analyze different types of D/A &A/D converters

C213	EC405PC	Electronic Circuit Analysis	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C213.1	Applies the knowledge of amplifiers in Electronic based systems.
C213.2	Designs, debug and test a Electronic system.
C213.3	Analyzes various signals using concepts of amplifiers.
C213.4	Designs and simulates a Various Amplifiers.
C213.5	Designs and simulate electronic system based on Amplifiers.

C214	EC406PC	Analog and Digital Communications Lab	0-0-3 (L-T-P)	1.5 Credits

Course outcomes: At the end of the course, the student will be able to:

C214.1	Analyze and design of various continuous wave and angle modulation and demodulation techniques.
C214.2	Attain the knowledge about AM, FM Transmitters and Receivers.
C214.3	Analyze and design the various pulse modulation Techniques.
C214.4	Understand the concept of Digital Modulation Techniques and Baseband Transmission.
C214.5	Understand the concept of Generation and Detection for various types Shift Keying

C215	EC407PC	IC Applications Lab	0-0-3 (L-T-P)	1.5 Credits

Course outcomes: At the end of the course, the student will be able to:

C215.1	To understand the various applications of operational amplifier (741).
C215.2	To design circuits using operational amplifiers for various applications.
C215.3	To design various combinational circuits using various Digital Integrated IC's.
C215.4	To differences between Linear and Digital Integrated IC's
C215.5	To design various types of Voltage Regulator.

C216	EC408PC	Electronic Circuit Analysis Lab	0-0-2 (L-T-P)	1 Credits

Course outcomes: At the end of the course, the student will be able to:

C216.1	Design the multistage amplifiers and understand the concepts of High Frequency Analysis of Transistors.
C216.2	Utilize the Concepts of negative feedback to improve the stability of amplifiers and positive feedback to generate sustained oscillations.
C216.3	Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio and Radio applications
C216.4	Design Multi-vibrators for various applications.
C216.5	Design sweep circuits for various applications.

C217	MC409	Gender Sensitization Lab	0-0-2 (L-T-P)	0 Credits

Course outcomes: At the end of the course, the student will be able to:

C217.1	Developed a better understanding of important issues related to gender in contemporary India
C217.2	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
C217.3	Acquire insight into the gendered division of labour and its relation to politics and economics.
C217.4	Develop a sense of appreciation of women in all walks of life
C217.5	Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence

III YEAR/I-SEMESTER

C301	EC501PC	Microprocessors & Microcontrollers	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C301.1	To Understand the internal organization of popular 8086 microprocessor &compare with other architectures.
C301.2	To Understand the internal organization of popular 8051 Microcontrollers & differentiate with processors.
C301.3	To Develop assembly language programming to design Microprocessor based systems
C301.4	To Develop assembly language programming to design Microcontrollers based systems
C301.5	To Understand the internal architecture and organization of ARM processors, Advanced ARM processors.

C302	EC502PC	Data Communications and Networks	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C302.1	Know the Categories and functions of various Data communication Networks
C302.2	Design and analyze various error detection techniques
C302.3	Demonstrate the mechanism of routing the data in network layer.

C302.4	Know the significance of various Flow control and Congestion control Mechanisms.
C302.5	Know the Functioning of various Application layer Protocols.

C303	EC503PC	Control Systems	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C303.1	Describe feedback control systems in mathematical terms of different equations, transfer functions and state-space models.
C303.2	Analyze the system response and stability in both time-domain and frequency domain
C303.3	Design compensators and simple feedback controllers using time-domain and frequency domain specifications
C303.4	Analyze the system response and stability of systems represented in state space form
C303.5	Design compensators for systems modeled in state space form.

C304	SM504MS	Business Economics & Financial Analysis	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C304.1	Tol understand the various Forms of Business and the Impact of economic Variable on the Business.
C304.2	To understand The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
C304.3	To understand how production function is carried out to Achieve least cost Combination of input and cost analysis.
C304.4	To study the framework for manual accounting process.
C304.5	To analyze and interpret the financial statement through Ratio analysis, Funds flow statement and Cash flow statement.

C305	EC511PE	Computer Organization & Operating Systems	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C305.1	Recognize the architectures of processors used in computing systems.
C305.2	Realize Micro-programmed control units for a simple processor
C305.3	Understand memory hierarchy and virtual memory concept
C305.4	Demonstrate various I/O & Memory Transfer Techniques
C305.5	Distinguish functional architectures of operating systems and file systems

C306	EC505PC	Microprocessors & Microcontrollers Lab	0-0-3 (L-T-P)	1.5 Credits

Course outcomes: At the end of the course, the student will be able to:

C306.1	To Apply the fundamentals of assembly level programming of microprocessors.
C306.2	To Build a program on a microprocessor using instruction set of 8086.
C306.3	To Summarize the concepts of Assembly level language programming and its applications.
C306.4	To Build a program on a microcontroller using instruction set of 8051.

C306.5	To Analyze abstract problems and apply a combination of hardware and software to address the problem

C307	EC506PC	Data Communications and Networks Lab	0-0-3 (L-T-P)	1.5 Credits

Course outcomes: At the end of the course, the student will be able to:

C307.1	Understand and explore the basics of networks, creating twonodes, links between nodes and transmit data between nodes using TcL script.
C307.2	Evaluating various LAN Topologies used in the layers of OSI model
C307.3	Demonstrate about various routing protocols and transport layer protocols
C307.4	Analyze and simulate the transport layer and Application layer protocols using wireshark
C307.5	Evaluate the performance of AODV and DSR routing protocols.

C308	EN508HS	Advanced Communication Skills Lab	0-0-2 (L-T-P)	1 Credits

Course outcomes: At the end of the course, the student will be able to:

C308.1	Develops confidence to use relevant vocabulary, using apt kinesics or body language in communication
C308.2	Infer the meaning of the text easily through comprehension techniques like, skimming, scanning and effective reading through proper vocabulary
C308.3	Analyze the writing skills through letters, reports and resume writing from the text and use for all professional settings
C308.4	Gather ideas, information and organize them relevantly in making presentations
C308.5	Self assured to organize and deliver discussions, presentations and strategies to face the interviews effectively

C309	*MC510	Intellectual Property Rights	3-0-0 (L-T-P)	0 Credits

Course outcomes: At the end of the course, the student will be able to:

C309.1	The students are able to understand Fundamentals of Intellectual property areas and its latest developments at National and International level
C309.2	The students are able to understand Trademarks acquisition and its remedies for violation
C309.3	The students are able to determine the Fundamentals of Copyrights Law, Copyrights ownership and remedies available for its violation.
C309.4	The students are able to apply their knowledge for Patent concept, its filing and Registration
C309.5	The students are able to explain Trade secrets Law and its protection

B.Tech. III Year I/II Semester	CYBER SECURITY	3-0-0-0 (L-T-P-C)	0 Credits

Course outcomes: At the end of the course, the student will be able to:

C310.1	Understand the basic concepts and terminologies of cyber security, including vulnerabilities, threats, and attacks.

C310.2	Understand the process and techniques involved in cyber forensics and digital evidence management.
C310.3	Evaluate security measures and policies for mobile devices and identify potential vulnerabilities.
C310.4	Understand the impact of cybercrimes on organizations and the associated financial, legal, and privacy implications.
C310.5	Understand fundamental data privacy concepts and identify different types of data privacy attacks.

III YEAR/II-SEMESTER

C311	EC601PC	Antennas and Propagation	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C311.1	To understand the radiation mechanism for different characteristic parameters with their mathematical relations for different practical cases.
C311.2	To Calculate the different parameters with current distribution patterns for various antennas.
C311.3	To Describe the behaviour of folded dipole, yagi-uda antenna, helical antennas, Horn antennas based on their geometry and frequency to measure the radiation patterns.
C311.4	To Design microstrip rectangular patch antenna and a parabolic reflector antenna with their requirements and feed structure for finding their patterns.
C311.5	To Develop the different wave propagation mechanisms with frequency ranges, characteristic features and parameters involved.

C312	EC602PC	Digital Signal Processing	3-1-0 (L-T-P)	4 Credits

Course outcomes: At the end of the course, the student will be able to:

C312.1	Understand the significance of various of signals and systems
C312.2	Understand the fast computation of DFT and appreciate the FFT processing.
C312.3	Design and realize IIR by Butter worth and Chebyshev methods
C312.4	Design and realize FIR by windowing methods
C312.5	Analyze and Implement a digital filter structures.

C313	EC603PC	VLSI Design	3-1-0 (L-T-P)	4 Credits

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

C313.1	To Analyze the behavior of MOS and BiCMOS with various loads
C313.2	To Analyze the VLSI Circuits through stick diagram, layout diagram 2Micro meter CMOS.
C313.3	To Analyze the transfer characteristics of CMOS logic gate.
C313.4	To Design building block of data path subsystem.
C313.5	To Design simple logic circuit using PLA, PAL, FPGA and CPLD.

C314	EC613PE	Embedded System Design	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C314.1	Understand Basic Concepts of Embedded Systems.
C314.2	Apply and Analyze the applications in various Processors and Domains of Embedded Systems.
C314.3	Analyze and develop embedded hardware and software development cycles and Tools.
C314.4	Analyze to understand different concepts of RTOS, Tasks, Process and Threads.
C314.5	Evaluate the Correlation between task synchronization and latency.

C315	ME800OE	NON-CONVENTIONAL SOURCES OF ENERGY	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C315.1	To recognize the awareness of energy conservation and Wind Power Plants
C315.2	To identify the principles of Photovoltaic Power Plants and Fuel Cells
C315.3	To identify the use of renewable energy sources for electrical power generation
C315.4	Understand the different energy storage methods
C315.5	Analyze the issues involved in the integration of renewable energy sources to the grid.

C316	EC604PC	Digital Signal Processing Lab	0-0-3 (L-T-P)	1.5 Credits

Course outcomes: At the end of the course, the student will be able to:

C316.1	To Understand the handling of discrete/digital signals using MATLAB
C316.2	To Understand the basic operations of Signal processing.
C316.3	To Analyse the spectral parameter of window functions
C316.4	To Design IIR, and FIR filters for band pass, band stop, low pass and high pass filters.
C316.5	To Analyse the Impulse Response of First order and Second Order Systems

C317	EC605PC	e – CAD Lab	0-0-3 (L-T-P)	1.5 Credits

Course outcomes: At the end of the course, the student will be able to:

C317.1	To Simulation of combinational circuit with test bench & implementation of the hardware using FPGA.
C317.2	To Simulation of sequential circuit with test bench & implementation of the hardware using FPGA.
C317.3	To Design a schematic and simple layout of CMOS Inverter & CMOS basic logic Gates.
C317.4	To Design a schematic and layout for complex CMOS of combinational circuit.
C317.5	To static timing analysis, IR drop analysis and crosstalk analysis of combinational circuit.

C318	EC606PC	Scripting Languages Lab	0-0-2 (L-T-P)	1 Credits

Course outcomes: At the end of the course, the student will be able to:

C318.1	Understanding the fundamentals of scripting programming language.
C318.2	Compare the scripting languages and programming languages.
C318.3	Applying scripting concepts like RUBY,PERL and TCL.
C318.4	Developing web based projects using scripting language.

C318.5	Analyze the real time applications by using scripting language.

C319	*MC609	Environmental Science	3-0-0 (L-T-P)	0 Credits

, **Course outcomes**: At the end of the course, the student will be able to:

C319.1	Gain knowledge about environment and ecosystem.
C319.2	Students will learn about natural resource, its importance and environmental impacts of Human activities on natural resource.
C319.3	Gain knowledge about the conservation of biodiversity and its importance.
C319.4	Aware students about problems of environmental pollution, its impact on human and Ecosystem and control measures.
C319.5	Students will learn about increase in population growth and importance of the acts.

B.Tech. III Year I/II Semester	FUNDAMENTALS OF AI	3-0-0-0 (L-T-P-C)	0 Credits

Course outcomes: At the end of the course, the student will be able to:

C320.1	Understand basic AI concepts, agents, and environments, and apply different search strategies (uninformed, heuristic) to solve AI problems.
C320.2	Implement advanced search algorithms like A*, Minimax, and Alpha-Beta pruning, and apply logic-based reasoning techniques (propositional and first-order logic).
C320.3	Apply probabilistic reasoning and knowledge representation techniques to manage uncertainty in AI systems.
C320.4	Understand different types of learning and apply machine learning techniques, such as decision trees, to solve AI problems.
C320.5	Design expert systems using domain-specific knowledge and reasoning techniques to solve complex problems.

IV YEAR/I-SEMESTER

C401	EC701PC	Microwave and Optical Communications	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C401.1	Derive the performance characteristics of known power generation at microwave frequencies
C401.2	Realize the need for solid state microwave sources and understand the principles of solid state devices.
C401.3	To Describe the behavior of folded dipole, yagi-uda antenna, helical antennas, Horn antennas based on their geometry and frequency to measure the radiation patterns.
C401.4	Understand the utility of S-parameters in microwave component design and learn the measurement procedure of various microwave parameters.
C401.5	Understand the mechanism of light propagation through Optical Fibers.

C402	EC713PE	Digital Image Processing	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of this course, students will demonstrate the ability to

C402.1	Exploration of the limitations of the computational methods on digital images.
C402.2	Expected to implement the spatial and frequency domain image transforms on Enhancement and restoration of images.
C402.3	Elaborate understanding on image enhancement techniques.
C402.4	Expected to define the need for compression and evaluate the basic compression algorithms.
C402.5	Expected to define the need for compression and evaluate the basic compression algorithms.

C403	CS721PE	Database Management Systems	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C403.1	Demonstrate the basic elements of a relational database management system
C403.2	Ability to identify the data models for relevant problems.
C403.3	Ability to design entity relationship model and convert entity relationship diagrams into RDBMS and formulate SQL queries on the data
C403.4	Apply normalization for the development of application software.
C403.5	Demonstrate familiarity with database storage structures and access Techniques.

C404	CS701OE	Python Programming	3-0-0 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C404.1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
C404.2	Demonstrate proficiency in handling Strings and File Systems.
C404.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
C404.4	Interpret the concepts of Object-Oriented Programming as used in Python
C404.5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python

C405	SM702MS	Professional Practice, Law & Ethics	1-0-4 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C405.1	Distinguish the personal ,professional and engineering ethics
C405.2	Interpret the contract laws
C405.3	Determine the arbitration and conciliation mechanism
C405.4	Examine the application of the labour laws

C405.5	Examine the Law relating to Intellectual property

C405	EC703PC	Microwave and Optical Communications Lab	0-0-2 (L-T-P)	1 Credits

Course outcomes: At the end of the course, the student will be able to:

C405.1	Verify characteristics of Reflex Klystron
C405.2	Analyze various parameters of Waveguide Components.
C405.3	Estimate the power measurements of RF Components such as directional Couplers.
C405.4	Demonstrate characteristics of various optical sources.
C405.5	Measure data Rate, Numerical Aperture and Losses in Optical Link.

C406	EC702PC	Industrial Oriented Mini Project/ Summer Internship	0-0-4 (L-T-P)	2 Credits

Course outcomes: At the end of the course, the student will be able to:

C406.1	To Demonstrate a sound technical knowledge of their selected project topic.
C406.2	To Undertake problem identification , formulation and solution.
C406.3	To Design engineering solutions to complex problems utilizing a systems approach.
C406.4	To demonstrate the knowledge ,skills and attitudes of a professional engineer
C406.5	Present the project results with clear demonstrations and showcasing its industry relevance.

C407	EC703PC	Seminar	0-0-2 (L-T-P)	1 Credits

Course outcomes: At the end of the course, the student will be able to:

C407.1	Spell for basic concepts of science and technology
C407.2	Contrast the understanding perceptive of techniques applicable to their domain
C407.3	Construct the solutions upon their own knowledge
C407.4	Improve their Presentation and Communication skills
C407.5	Make up them to pursue their placements and higher studies

C408	EC704PC	Project Stage – I	0-0-6 (L-T-P)	3 Credits

Course outcomes: At the end of the course, the student will be able to:

C408.1	Analyze new problem, identify and define the appropriate requirement for its solutions
C408.2	Develop the solution for contemporary problems using modern tools for suitable development.
C408.3	Demonstrate ethical and professional sustainability while working in a team and communicate effectively for the benefit of the society.
C408.4	Understand the engineering, financial and management principle
C408.5	Recognize the need for long learning in the broadcast context of technological change.

IV YEAR/II-SEMESTER

C409	EC800OE	RADAR SYSTEM	3-0-0 (L-T-P)	3 Credits

Course outcomes: After Completion of the course the student is able to

C409.1	Illustrate the factors affecting the Radar performance using Radar Range Equation.
C409.2	Analyze the principle of FM-CW radar and apply it in FM- CW Altimeter.
C409.3	Differentiate between a MTI Radar and a Pulse Doppler Radar based on their working principle.
C409.4	Analyze the different Tracking Radar principles for tracking the targets.
C409.5	Demonstrate the basic principle of Receiver and also extraction of signal in Noise.

C410	EC811PE	Low Power VLSI Design	3-0-0 (L-T-P)	3 Credits

Course outcomes: After completion of this course, the student will be able to:

C410.1	Demonstrate in depth knowledge in the limitations of low power design and different sources of power dissipation.
C410.2	Acquire the knowledge in various low power design approaches and techniques.
C410.3	Analyze and design various types of low power adders
C410.4	Apply the different low power techniques for designing multipliers
C410.5	Apply the different low power techniques for designing Memory

C411	MT8020E	Total Quality management	3-0-0 (L-T-P)	3 Credits

Course outcomes: After completion of this course, the student able to

C411.1	To explain significance of quality control.
C411.2	To examine customer satisfaction.
C411.3	To illustrate various tools of total quality management.
C411.4	To evaluate accounting system and quality management.
C411.5	To develop the organization to meet ISO9000 standards.

C412	EC801PC	Project Stage – II	0-0-14 (L-T-P)	7 Credits

Course outcomes: At the end of the course, the student will be able to:

C412.1	To Demonstrate a sound technical knowledge of their selected project topic.
C412.2	To Undertake problem identification, formulation and solution.
C412.3	To Design engineering solutions to complex problems utilizing a systems approach.
C412.4	To demonstrate the knowledge, skills and attitudes of a professional engineer.
C412.5	Ability to function effectively as an individual as experienced during the project work.