



Nimra College of Engineering & Technology

Estd. By Nimra Educational Society (A Muslim Minority Society)
 Affiliated to JNTUK, Approved by AICTE, New Delhi, Permitted by Govt. of A.P.
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| UG(B.TECH)-- (ELECTRONICS AND COMMUNICATION ENGINEERING) | | |
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| COURSE OUTCOMES FOR FIRST YEAR FIRST SEMESTER | | |
| COURSE TITLE WITH CODE | CO | STATEMENT |
| COMMUNICATIVE ENGLISH (R201102) | CO - 1 | Understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific informational |
| | CO - 2 | Ask and answer general questions on familiar topics and introduce oneself/other's |
| | CO - 3 | Employ suitable strategies for skimming and scanning to get the general idea of at extend locate specific informational |
| | CO - 4 | recognize paragraph structure and be able to match beginnings endings/headings the paragraphs |
| | CO - 5 | form sentences using proper grammatical structures and correct word forms |
| MATHEMATICS-I (R201101) | CO - 1 | Utilize mean value theorem solve all if problems(L3) |
| | CO - 2 | Solve the differential equations related to various engineering fields(L3) |
| | CO - 3 | Familiarize with functions of several variables which is use full in optimization(L3) |
| | CO - 4 | Apply double integration techniques in evaluating are as bounded by region(L3) |
| | CO - 5 | Students will also learn important tools of calculus in higher dimensions |
| APPLIED CHEMISTRY (R201115) | CO - 1 | Analyze the different types of composite plastic materials and interpret the mechanism of conduction in conducting polymers. |
| | CO - 2 | Utilize the theory of construction of electrodes, batteries and fuel cells in redesigning new engineering products and categorize the reasons for corrosion and study methods to control corrosion |
| | CO - 3 | Synthesize nano materials for modern advances of engineering Obtain the knowledge of computational chemistry and molecular machine technology. Summarize the preparation of semiconductors; analyze the applications of liquid crystals and superconductors. |
| | CO - 4 | Analyze the principles of different analytical instruments and their applications. Design models for energy by different natural sources. |
| | CO - 5 | Obtain the knowledge of computational chemistry and molecular machines |
| PROGRAMMING FOR PROBLEM SOLVING USING C (R201110) | CO - 1 | To write algorithms and to draw flow charts for solving problems |
| | CO - 2 | To convert flowcharts/algorithms to C Programs, compile and debug programs |
| | CO - 3 | To use different operators, data types and write programs that use two-way/ multi-way selection |
| | CO - 4 | To select the best loop construct for a given problem |
| | CO - 5 | To decompose a problem into functions and to develop modular reusable code to apply File/operations. |
| ENGINEERING DRAWING (R201104) | CO - 1 | Parabola, Ellipse and Hyperbola by general and special methods, cycloids, involutes, tangents & normals for the curves. |
| | CO - 2 | To introduce the students to use orthographic projections, projections of points & simple lines. To make the students draw the projections of the lines inclined to both the planes. |
| | CO - 3 | The objective is to make the students draw the projections of the plane inclined to both the planes. |
| | CO - 4 | The objective is to make the students draw the projections of the various types of solids in different positions inclined to one of the planes |
| | CO - 5 | The objective is to represent the object in 3D view through isometric views. The student will be able to represent and convert the isometric view to orthographic view and vice versa. |

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| ENGLISH COMMUNICATION SKILLS LABORATORY (R201106) | CO - 1 | Vowels, Consonants, Pronunciation, Phonetic Transcription, Common Errors in Pronunciation. |
| | CO - 2 | Word stress-di-syllabic words, poly-syllabic words, weak and strong forms, contrastive stress(Homographs) |
| | CO - 3 | Stress in compound words, rhythm, intonation, accent neutralisation. |
| | CO - 4 | Listening to short audio texts and identifying the context and specific pieces of information to answer a series of questions in speaking. |
| | CO - 5 | Newspapers reading; Understanding and identifying key terms and structures useful for writing reports. |
| APPLIED CHEMISTRY LAB (R201116) | CO - 1 | The students entering into the professional course have practically very little exposure to lab classes |
| | CO - 2 | The experiments introduce volumetric analysis; redox titrations with different indicators |
| | CO - 3 | then they are exposed to a few instrumental methods of chemical analysis. |
| | CO - 4 | Thus at the end of the lab course, the student is exposed to different methods of chemical analysis and use of some commonly employed instruments |
| | CO - 5 | They thus acquire some experimental skills. |
| PROGRAMMING FOR PROBLEM SOLVING USING C LAB (R201113) | CO - 1 | Gains Knowledge on various concepts of a C language |
| | CO - 2 | Able to draw flowcharts and write algorithms. |
| | CO - 3 | Able design and development of C problem solving skills |
| | CO - 4 | Able to design and develop modular programming skills. |
| | CO - 5 | Able to trace and debug a program |

COURSE OUTCOMES FOR FIRST YEAR SECOND SEMESTER

| COURSE TITLE WITH CODE | CO | STATEMENT |
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| MATHEMATICS-II (R201201) | CO - 1 | Develop the use of matrix algebra techniques that is needed by engineers for practical applications (L6) |
| | CO - 2 | Solve system of linear algebraic equations using Gausse limitation, Gauss Jordan, Gauss Seidel(L3) |
| | CO - 3 | evaluate the approximate roots of polynomial and transcendental equations by different algorithms (L5) |
| | CO - 4 | apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals (L3) |
| | CO - 5 | Apply numerical integral techniques to different Engineering problems(L3) |
| APPLIED PHYSICS (R201207) | CO - 1 | Explain the need of coherent sources and the conditions for sustained interference(L2) |
| | CO - 2 | Understand the basic concepts of LASER light Sources(L2) Apply the concepts to learn the types of lasers |
| | CO - 3 | Explain the concept of dual nature of matter(L2) Understand the significance of wave function |
| | CO - 4 | Explain the concept of dielectric constant and polarization in dielectric materials |
| | CO - 5 | Explain Meissner's effect, BCS theory & Josephson effect in super conductors(L2) |
| OBJECT ORIENTED PROGRAMMING THROUGH JAVA (R201212) | CO - 1 | Show competence in the use of the Java programming language in the development of small to medium- sized application programs that demonstrate professionally acceptable coding and performance standard |
| | CO - 2 | Illustrate the basic principles of the object-oriented programming |
| | CO - 3 | Demonstrate an introductory understanding of graphical user interfaces, multi threaded programming, and event-driven programming. |
| | CO - 4 | Basics of Java programming, Data types, Variables, Operators, Control structures including selection |
| | CO - 5 | Inheritance in java, Super and sub class, Overriding, Object class, |
| NETWORK ANALYSIS (R201213) | CO - 1 | Gain the knowledge on basic network elements. |
| | CO - 2 | Will analyze the RLC circuits behavior in detailed |
| | CO - 3 | analyze the performance of periodic waveforms. |
| | CO - 4 | Gain the knowledge in characteristics of two port network parameters(Z, Y, ABCD, h & g). |
| | CO - 5 | Analyze the filter design concepts in real world applications. |

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| BASIC ELECTRICAL ENGINEERING (R201214) | CO - 1 | Able to explain the operation of DC generator and analyze the characteristics of DC generator. |
| | CO - 2 | Able to explain the principle of operation of DC motor and analyze their characteristics. Acquire the skill to analyze the starting and speed control methods of DC motors. |
| | CO - 3 | Ability to analyze the performance and speed – torque characteristics of a 3-phase induction motor and understand starting methods of 3- phase induction motor. |
| | CO – 4 | Able to explain the operation of Synchronous Machines |
| | CO – 5 | Capability to understand the operation of various special machines. |
| ELECTRONIC WORKSHOP LAB (R201237) | CO - 1 | Hands on experience with the use of laboratory equipment |
| | CO - 2 | Working experience with prototype board and solder and desolder the discrete components on a project board. |
| BASIC ELECTRICAL ENGINEERING LAB (R201238) | CO - 1 | To analyze and solve electrical circuits using network laws and theorems. |
| | CO - 2 | To understand and analyze basic Electric and Magnetic circuits |
| APPLIED PHYSICS LABORATORY (R201233) | CO - 1 | The students will be able to use the different components and equipment in physics practical. |
| | CO - 2 | The students will also be able to work effectively and safely in the laboratory environment independently and as well as in teams. |
| ENVIRONMENTAL SCIENCE (R201230) | CO - 1 | The objective is to represent the object in 3D view through isometric views |
| | CO - 2 | The student will learn how to visualize 2D & 3D objects. |

COURSE OUTCOMES FOR SECOND YEAR FIRST SEMESTER

| COURSE TITLE WITH CODE | CO | STATEMENT |
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| ELECTRONIC DEVICES AND CIRCUITS (R2021041) | Co-1 | Apply the basic concepts of semiconductor physics |
| | Co-2 | Understand the formation of p-n junction and how it can be used as a p-n junction as diode in different modes of operation |
| | Co-3 | Know the construction, working, principle of rectifiers with and without filters with the relevant expressions and necessary comparisons |
| | Co- 4 | Understand the construction, principle of operation of transistors, BJT and FET with their V-I characteristics in different configurations |
| | Co-5 | Know the need of transistor biasing, various biasing techniques for BJT and FET and stabilization |
| SWITCHING THEORY AND LOGIC DESIGN (R2021042) | Co-1 | Classify different number systems and apply to generate various codes. Use the concept of Boolean algebra in minimization of switching functions |
| | Co-2 | Apply knowledge of flip-flops in designing of Registers and counters |
| | Co-3 | The operation and design methodology for synchronous sequential circuits and algorithmic state machines. |
| | Co- 4 | Study the following relevant ICs and their relevant functions |
| | Co-5 | Produce innovative designs by modifying the traditional design techniques. |
| SIGNALS AND SYSTEMS (R2021043) | Co-1 | Differentiate the various classifications of signals and systems |
| | Co-2 | Analyze the frequency domain representation of signals using Fourier concepts |
| | Co-3 | Classify the systems based on their properties and determine the response of LTI Systems |
| | Co- 4 | Know the sampling process and various types of sampling techniques. |
| | Co-5 | Apply Laplace and z-transforms to analyze signals and Systems (continuous & discrete). |
| RANDOM VARIABLES AND STOCHASTIC PROCESSES (R2021044) | Co-1 | mathematically model and solve simple probabilistic problems. |
| | Co-2 | Identify different types of random variables and compute statistical averages of the same random variables. |
| | Co-3 | Characterize the random processes in the time and frequency domains. |
| | Co- 4 | Analyze the LTI systems with random inputs |
| | Co-5 | Density Spectra of Input and Output, Bandpass, Band-Limited and Narrow band Processes, Properties. |
| | Co-1 | Laplace transforms of standard functions – Shifting theorems – Transforms of derivatives and integrals |

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| MATHEMATICS-III (R2021011) | Co-2 | Line integral–Work done–Area–Surface and volume integrals–Vector integral theorems: Greens, Stokes and Gauss Divergence theorems (without proof). |
| | Co-3 | Solving ordinary differential equations (initial value problems) using Laplace transforms. |
| | Co- 4 | Solutions of first order linear (Lag range) equation and nonlinear (standard types) equations. |
| | Co-5 | Second order PDE: Solutions of line a r partial differential equations with constant co efficient –RHS term of the type e^{ax+by} , $\sin(ax+by)$, $\cos(ax+by)$, $x^m y^n$. |
| OOPS THROUGH JAVA LAB (R2021045) | Co-1 | identify classes, objects, members of a class and the relationship among the m needed for a specific problem |
| | Co-2 | Implement programs to distinguish different forms of inheritance |
| | Co-3 | Create packages and to reuse them |
| | Co- 4 | Develop programs using Exception Handling mechanism |
| | Co-5 | Design GUI based applications using Swings and AWT. |
| ELECTRONIC DEVICES AND CIRCUITS LAB (R2021046) | Co-1 | Verify the rectifier circuits using diodes and implement them using hardware. |
| | Co-2 | Design the biasing circuits like self biasing |
| | Co-3 | Analyze the concepts of SCR and observe its characteristics. |
| | Co- 4 | Remember the concepts of unipolar junction transistor and observe its characteristics. |
| | Co-5 | Understand the construction, operation and characteristics of JFET and MOSFET, which can be used in the design of amplifier |
| SWITCHING THEORY AND LOGIC DESIGN LAB (R2021047) | Co-1 | To solve a typical number base conversion, analyze new error coding techniques and behaviour of logic gates |
| | Co-2 | To Simplify Boolean functions unng Karnaugh maps and Quine McCluskey methods |
| | Co-3 | To understand concepts of combinational circuits |
| | Co- 4 | To understand sequential circuits by learning flip-flops and their applications |
| | Co-5 | COS To develop advanced sequential circuits with meelay and more models |
| PYTHON LAB (SKILL ORIENTED COURSE) (R2021048) | Co-1 | Know comprehensions, generators in python. |
| | Co-2 | Know exception handling inpython |
| | Co-3 | Know file I/O |
| | Co- 4 | to Understand various data types like lists, tuples, strings etc |
| | Co-5 | To Know the usage of various pre-defined functions on the above data types |
| COURSE OUTCOMES FOR SECOND YEAR SECOND SEMESTER | | |
| COURSE TITLE WITH CODE | CO | STATEMENT |
| ELECTRONIC CIRCUIT ANALYSIS (R2022041) | Co-1 | To Design and analysis of small signal high frequency transistor amplifier using BJT and FET. |
| | Co-2 | Design and analysis of multistage amplifiers using BJT and FET and Differential amplifier using BJT. |
| | Co-3 | Derive the expressions for frequency of oscillation and condition for oscillation of RC and LC oscillators and their amplitude and frequency stability concept |
| | Co- 4 | Know the classification of the power and tuned amplifiers and their analysis with performance comparison |
| | Co-5 | Q-Factor, small signal tuned amplifier, capacitance single tuned amplifier, double tuned amplifiers, staggered tuned amplifiers |
| DIGITAL IC DESIGN (R2022042) | Co-1 | Introduction to Verilog HDL, data types, data operators, module statement, wire statement, if- else statement, case-end case statement, Verilog syntax and semantics(qualitative approach) |
| | Co-2 | Parallel binary adder, carry look ahead adder, BCD adder, Multiplexers and demultiplexers and their use in combinational logic design |
| | Co-3 | Registers, applications of shift registers, ripple or a synchronous counters synchronous counters, synchronous and a synchronous sequential circuits, hazards in sequential circuits |
| | Co- 4 | Introduction, MOS logic circuits with depletion n MOS loads |
| | Co-5 | Introduction, behavior bistable elements, SR latch circuit, clocked latch and flip-flop circuits: clocked SR latch |

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| ANALOG COMMUNICATIONS (R2022043) | Co-1 | Differentiate various Analog modulation and demodulation schemes and their spectral characteristics |
| | Co-2 | Analyze noise characteristics of various analog modulation methods |
| | Co-3 | Analyze various functional blocks of radio transmitters and receivers |
| | Co- 4 | Communication Receivers, extensions of super heterodyne principle and additional circuits. |
| | Co-5 | Noise in DSB & SSB System, Noise in AM System, Noise in Angle Modulation Systems, Threshold effect in Angle Modulation System, |
| LINEAR CONTROL SYSTEMS (R2022044) | Co-1 | This course introduces the concepts of feedback and its advantages to various control systems |
| | Co-2 | The performance metrics to design the control system in time-domain and frequency domain are introduced |
| | Co-3 | Control systems for various applications can be designed using time-domain and frequency domain analysis. |
| | Co- 4 | In addition to the conventional approach, the state space approach for the analysis of control systems is also introduced. |
| | Co-5 | Time invariant state Equations- State Transition Matrix and it's Properties – Concepts of Controllability and Observability |
| MANAGEMENT AND ORGANISATIONAL BEHAVIOUR (R2022045) | Co-1 | After completion of the Course the student will acquire the knowledge on management functions, global leadership and organizational structure |
| | Co-2 | Will familiarize with the concepts of functional management that is HR Mand Marketing of new product developments |
| | Co-3 | The learnerisable to think in strategically through contemporary management practices. |
| | Co- 4 | 4. The learner can develop positive attitude through personality development and can equip with motivational theories. |
| | Co-5 | 5. The student can attain the group performance and grievance handling in managing the organizational culture. |
| ELECTRONIC CIRCUIT ANALYSIS LAB (R2022046) | Co-1 | single and multistage amplifiers at low, mid and high frequencies |
| | Co-2 | Designing and analyzing the transistor at high frequencies. |
| | Co-3 | Determine the efficiencies of power amplifiers |
| | Co- 4 | Designing and analyzing the transistor at high frequencies. |
| | Co-5 | Determine Frequency response and design of tuned amplifiers |
| ANALOG COMMUNICATIONS LAB (R2022047) | Co-1 | Demonstrate generation and detection of analog and digital modulation techniques. |
| | Co-2 | Explain sampling, PCM, delta modulation, adaptive delta modulation and superheterodyne receiver. |
| | Co-3 | Compare the different analog and digital modulation techniques. |
| | Co- 4 | Distinguish various line coding schemes used for digital data transmission |
| | Co-5 | Apply time division multiplexing concepts in different pulse modulation techniques |
| DIGITAL IC DESIGN LAB (R2022048) | Co-1 | Understand the function of elementary digital circuits under real and simulated |
| | Co-2 | Identify the various digital ICs and understand their operation. |
| | Co-3 | Apply Boolean laws and K-map to simplify the digital circuits. |
| | Co- 4 | Understand the function of elementary digital circuits under real and simulated environment. |
| | Co-5 | Prepare a report on basics of digital electronics and handling of ICs |
| SOFT SKILLS (SKILL ORIENTED COURSE) (R2022049) | Co-1 | Have a clear representation about structure of the course and its assessment. |
| | Co-2 | Be able to set goals and manage your own professional and personal development. |
| | Co-3 | Apply reflective practice to understand your learning processes and articulate and evaluate personal objectives and motivation. |
| | Co- 4 | Understand conception of Soft Skills. |
| | Co-5 | Assume responsibility for your learning and self-assessment. |

COURSE OUTCOMES FOR THIRD YEAR FIRST SEMESTER

| COURSE TITLE WITH CODE | CO | STATEMENT |
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| | Co-1 | Describe the Op-Amp and internal Circuitry: 555 Timer, PLL |

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| ANALOG ICS AND APPLICATION (R2031041) | Co-2 | Discuss the Applications of Operational amplifier: 555 Timer, PLL |
| | Co-3 | Design the Active filters using Operational Amplifier |
| | Co- 4 | Use the Op-Amp in A to D & D to A Converters |
| | Co-5 | Design & Analysis of Butterworth active filters – 1st order, 2nd order LPF, HPF filters. Band pass, Band reject and all pass filters. |
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| ELECTROMAGNETIC WAVES AND TRANSMISSION LINES (R2031042) | Co-1 | Determine E and H using various laws and applications of electric & magnetic fields |
| | Co-2 | Apply the Maxwell equations to analyze the time varying behavior of EM waves |
| | Co-3 | Gain the knowledge in uniform plane wave concept and characteristics of uniform plane wave in various media |
| | Co- 4 | Calculate Brewster angle, critical angle and total internal reflection |
| | Co-5 | Derive and Calculate the expressions for input impedance of transmission lines, reflection coefficient, VSWR etc. using smith chart |
| DIGITAL COMMUNICATIONS (R2031043) | Co-1 | Analyze the performance of a Digital Communication System for probability of error and are able to design a digital communication system. |
| | Co-2 | Analyze various source coding techniques |
| | Co-3 | Compute and analyze Block codes, cyclic codes and convolution codes |
| | Co-4 | Design a coded communication system. |
| | Co-5 | Introduction,ASK,FSK,PSK,DPSK,DEPSK,QPS K,M ary PSK,ASK,FSK, similarity of BFSKand BPSK. |
| Renewable Energy Sources (R203102F) | Co-1 | Able to understand the renewable energy sources available at present. |
| | Co-2 | Able to understand the solar energy operation and its characteristics. |
| | Co-3 | To educate the wind energy operation and its types |
| | Co-4 | To educate the tidal and geothermal energy principles and its operation. |
| | Co-5 | Able to understand the biomass energy generation and its technologies. |
| ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (R203104B) | Co-1 | Select the instrument to be used based on the requirements |
| | Co-2 | Understand and analyze different signal generators and analyzers. |
| | Co-3 | Understand the design of oscilloscopes for different applications. |
| | Co- 4 | Design different transducers for measurement of different parameters. |
| | Co-5 | Transducers-active & passive transducers: Resistance, Capacitance, inductance, Strain gauges, LVDT, Piezo Electric transducers. |
| ANALOG ICs AND APPLICATIONS LAB (R2031044) | Co-1 | Understand how probing influences a circuit |
| | Co-2 | Identify and explain the limitations of op-amps in analog circuit designs |
| | Co-3 | Identify the currents, and how they change with applied potentials, flowing through a semiconductor, diode, and transistor |
| | Co- 4 | Design and simulate transistor amplifiers |
| | Co-5 | Use SPICE verify hand calculations and aid in the design of analog integrated circuits |
| DIGITAL COMMUNICATIONS LAB (R2031045) | Co-1 | Design a coding communication system |
| | Co-2 | Analyse the performance of a digital communication system for probability of error and are able to design a digital communication system |
| | Co-3 | Analyse various error techniques |
| | Co- 4 | Analyse various source coding techniques |
| | Co-5 | communte and Analyse block code's, cyclic codes and convolute |
| DATA STRUCTURES USING JAVA LAB (R2031046) | Co-1 | Understanding of different data structures that are suitable for problems to be solved efficiently. |
| | Co-2 | Understanding of the design and analysis of algorithms based on different data structures. |
| | Co-3 | Understanding of the algorithms complexity for both iterative as well as for recursive approaches. Understanding of sorting and searching techniques. |
| | Co- 4 | Understanding to implement data structures and algorithms. |
| | Co-5 | Understanding of how common computational problems can be solved efficiently on a computer. |

COURSE OUTCOMES FOR THIRD YEAR SECOND SEMESTER

| COURSE TITLE WITH CODE | CO | STATEMENT |
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| MICROPROCESSOR AND MICROCONTROLLERS (R2032041) | Co-1 | to Understand the architecture of microprocessor/ microcontroller and their operation |
| | Co-2 | Semiconductor memories interfacing (RAM, ROM), Intel 8255 programmable peripheral interface. |
| | Co-3 | Hardware concepts, Input/output ports and circuits, external memory. |
| | Co- 4 | Demonstrate programming skills in assembly language for processors and Controllers. |
| | Co-5 | Analyze various interfacing techniques and apply them for the design of processor / Controller based systems. |
| VLSI DESIGN (R2032042) | Co-1 | Demonstrate a clear understanding of CMOS fabrication flow and technology scaling. |
| | Co-2 | Apply the design Rules and draw layout of a given logic circuit. |
| | Co-3 | Analyze the behavior of amplifier circuits with various loads. |
| | Co- 4 | Design MOSFET based logic circuits using various logic styles like static and dynamic CMOS. |
| | Co-5 | Design various applications using FPGA. |
| DIGITAL SIGNAL PROCESSING (R2032043) | Co-1 | Apply the difference equations concept in the analysis of Discrete time systems |
| | Co-2 | Use the FFT algorithm for solving the DFT of a given signal |
| | Co-3 | Design a Digital filter (FIR&IIR) from the given specifications 4. Realize the FIR and IIR structures from the designed digital filter |
| | Co- 4 | Use the Multirate Processing concepts in various applications (eg: Design of phase shifters, Interfacing of digital systems |
| | Co-5 | Apply the signal processing concepts on DSP Processor. |
| MOBILE & CELLULAR COMMUNICATION (R203204B) | Co-1 | Types of interferences, Introduction to Co-Channel Interference, real time Co-Channel interference, Co-Channel measurement, |
| | Co-2 | Numbering and grouping, setup access and paging channels, channel assignments to cell sites and mobile units: |
| | Co-3 | Identify the limitations of conventional mobile telephone systems; understand the concepts of cellular systems. |
| | Co- 4 | Understand the frequency management, channel assignment strategies and antennas in cellular systems |
| | Co-5 | To Understand the concepts of handoff and architectures of various cellular systems. |
| FUNDAMENTALS OF UTILIZATION OF ELECTRICAL ENERGY (R203202G) | Co-1 | Maintain/Troubleshoot various lamps and fittings in use |
| | Co-2 | Maintain various electric heating and equipments industries. welding used in |
| | Co-3 | Maintain Electric Drive and elevator used in industries. |
| | Co-4 | Maintain Electric Traction system. |
| | Co-5 | Maintain various domestic electrical appliances |
| MICROPROCESSOR AND MICROCONTROLLERS LAB (R203244) | Co-1 | To Understand and execute programs based on 8086 microprocessor. |
| | Co-2 | To Design Memory Interfacing circuits. |
| | Co-3 | To Design the biasing circuits like self biasing. |
| | Co- 4 | To Design and interface I/O circuits. |
| | Co-5 | To Design and implement 8051 microcontroller based systems. |
| VLSI DESIGN LAB (R2032045) | Co-1 | To Explain the basic building blocks of digital systems like logic gates and adders. |
| | Co-2 | To Comprehend the design and functionality of combinational and sequential circuits like multiplexers, encoders, flip-flops, counters etc. |
| | Co-3 | To apply design techniques and modelling methods like Behavioral, structural and dataflow for implementation of digital systems. |
| | Co- 4 | To Analyze different logic families, CMOS gate implementations and timing considerations for layout design. |
| | Co-5 | To Evaluate and simulate digital systems designed using HDL and CMOS layouts with respect to functionality, timing and power. |
| DIGITAL SIGNAL PROCESSING LAB | Co-1 | To Formulate engineering problems in terms of DSP operations |
| | Co-2 | To Analyse digital signal and systems |
| | Co-3 | To Analyse discrete the time signals in frequency domain |

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| (R2032046) | Co- 4 | To Design digital filters and impliment with different structures |
| | Co-5 | To Understand the key architecture |
| ARM BASED/ AURDINO BASED PROGRAMMING LAB (R2032047) | Co-1 | To Comprehend Microcontroller-Transducers Interface techniques |
| | Co-2 | To Establish Serial Communication link with Arduino |
| | Co-3 | To Analyze basics of SPI interface |
| | Co- 4 | To Interface Stepper Motor with Arduino |
| | Co-5 | To Analyze Accelerometer interface techniques |

COURSE OUTCOMES FOR FOURTH YEAR FIRST SEMESTER

| COURSE TITLE WITH CODE | CO | STATEMENT |
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| RADAR ENGINEERING (R204104G) | CO - 1 | To Derive the radar range equation and to solve some analytical problems. |
| | CO - 2 | To Understand the different types of radars and its applications. |
| | CO - 3 | To Understand the concept of tracking and different tracking techniques. |
| | CO - 4 | To Understand the various components of radar receiver and its performance. |
| SATELLITE COMMUNICATION (R204104D) | CO - 1 | To Understand the concepts, applications and subsystems of Satellite communications |
| | CO - 2 | To Introduction, Transmitters, Receivers, Antennas, Tracking systems, Terrestrial interface, Primary power test methods. |
| | CO - 3 | To Derive the expression for G/T ratio and to solve some analytical problems on satellite link design. |
| | CO - 4 | To Understand the various types of multiple access techniques and architecture of earth station design. |
| | CO -- 5 | To Understand the concepts of GPS and its architecture. |
| OPTICAL COMMUNICATION (R204104A) | CO - 1 | To Choose necessary components required in modern optical communications systems . |
| | CO - 2 | To Design and build optical fiber experiments in the laboratory, and learn how to calculate electromagnetic modes in waveguides, the amount of light lost going through an optical system, dispersion of optical fibers. |
| | CO - 3 | Use different types of photo detectors and optical test equipment to analyze optical fiber and light wave systems. |
| | CO - 4 | Choose the optical cables for better communication with minimum losses |
| | CO -- 5 | Design, build and demonstrate optical fiber experiments in the laboratory |
| IMAGE PROCESSING (R204105O) | CO - 1 | Articulate the fundamentals of Digital image procesang including the ample image formation and relationship between pixels |
| | CO - 2 | Application of different types of Image transformation techniques, histogram processing and application of spatial filters |
| | CO - 3 | Analyse the significance of image restoration and procesing of colour images |
| | CO - 4 | Illustrate the image compression like lossy and loss less image compresnon techniques |
| | CO -- 5 | Understand the fundamental concepts of digital image processing, |
| DEEP LEARNING TECHNIQUES (R204105E) | CO - 1 | Distinguish between, supervised, unsupervised and senu-supervised learning |
| | CO - 2 | Apply the appropriate machine learning strategy for any given problem |
| | CO - 3 | Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem |
| | CO - 4 | Design systems that uses the appropriate graph models of machine learning |
| | CO -- 5 | Modify existing machine learning algorithms to improve classification efficiency. |
| UNIVERSAL HUMAN VALUES 2 : UNDERSTANDING (R2041011) | CO - 1 | Upon completion of the course, students shall have ability to Understand about themselves and their surroundings |
| | CO - 2 | Understand and take responsibilities in life and handle problems to attain sustainable solutions while keeping human relationships |
| | CO - 3 | human nature in mind. Apply responsibilities towards their commitments |
| | CO - 4 | Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made |
| | CO -- 5 | Analyse ethical and unethical practices, and formulate strategies to [AN] actualize a harmonious environment wherever they work. |

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| DESIGNER TOOLS (R204104Z) | CO – 1 | Describe the principles of heat transfer mechanisms, combustion, refrigeration and air conditioning systems in its fundamental aspect with relation to existing energy systems |
| | CO –2 | Apply relationship between theoretical and practical aspects of heat transfer application |
| | CO –3 | Analyse principles of energy mechanisms to solve a wide range of thermal engineering problems |