# COURSE OUTCOMES

MACET
MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY
ESTD: 2006

## DEPARTMENT OFELECTRONICS AND COMMUNICATION ENGINEERING

**ANNA UNIVERSITY REGULATION 2021(ECE)**
**LIST OF COURSE NAMES**

| S.No | Sem | Course Code | Course Name |
|---|---|---|---|
| 1. | I | HS3152 | Professional English I |
| 2 | I | MA3151 | Matrices and Calculus |
| 3 | I | PH3151 | Engineering Physics |
| 4 | I | CY3151 | Engineering Chemistry |
| 5 | I | GE3151 | Problem Solving and Python Programming |
| 6 | I | GE3171 | Problem Solving and Python Programming Laboratory |
| 7 | I | BS3171 | Physics and Chemistry Laboratory (Physics) |
| 8 | I | BS3171 | Physics and Chemistry Laboratory (Chemistry) |
| 9 | I | GE3172 | English Laboratory |
| 10 | II | HS3252 | Professional English II |
| 11 | II | MA3251 | Statistics and Numerical Methods |
| 12 | II | PH3254 | Physics for Electronics Engineering |
| 13 | II | BE3254 | Basic Electrical and Instrumentation Engineering |
| 14 | II | GE3251 | Engineering Graphics |
| 15 | II | EC3251 | Circuit Analysis |
| 16 | II | GE3271 | Engineering Practices Laboratory |
| 17 | II | EC3271 | Circuit Analysis Laboratory |
| 18 | II | GE3272 | Communication Laboratory |
| 19 | III | MA3355 | Random Processes and Linear Algebra |
| 20 | III | CS3353 | C Programming and Data Structures |
| 21 | III | EC3354 | Signals and Systems |
| 22 | III | EC3353 | Electronic Devices and Circuits |
| 23 | III | EC3351 | Control Systems |
| 24 | III | EC3352 | Digital System Design |
| 25 | III | EC3361 | Electronic devices and Circuits Laboratory |
| 26 | III | CS3362 | C Programming and Data structures Laboratory |

| | | | |
|---|---|---|---|
| 27 | IV | EC3452 | Electromagnetic Fields |
| 28 | IV | EC3401 | Networks and Security |
| 29 | IV | EC3451 | Linear Integrated Circuits |
| 30 | IV | EC3492 | Digital Signal Processing |
| 31 | IV | EC3491 | Communication Systems |
| 32 | IV | GE3451 | Environmental Sciences and Sustainability |
| 33 | IV | EC3461 | Communication Systems Laboratory |
| 34 | IV | EC3462 | Linear Integrated Circuits Laboratory |
| 35 | V | EC3501 | Wireless Communication |
| 36 | V | EC3552 | VLSI And Chip Design |
| 37 | V | EC3551 | Transmission Lines And RF Systems |
| 38 | V | CEC365 | Wireless Sensor Network Design |
| 39 | V | CEC352 | Satellite Communication |
| 40 | V | CEC345 | Optical Communication & Networks |
| 41 | V | MX3084 | Disaster Risk Reduction And Management |
| 42 | V | EC3561 | VLSI Laboratory |
| 43 | VI | ET3491 | Embedded Systems and IOT Design |
| 44 | VI | CS3491 | Artificial Intelligence and Machine Learning |
| 45 | VI | CEC334 | Analog IC Design |
| 46 | VI | CEC348 | Remote Sensing |
| 47 | VI | MX3089 | Industrial Safety |
| 48 | VI | OEE351 | Renewable Energy System |

# I SEMESTER

**Course Code & Course Name: HS3152 – Professional English I**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To use appropriate words in a professional context |
| **CO2** | To gain understanding of basic grammatic structures and use them in right context. |
| **CO3** | To read and infer the denotative and connotative meanings of technical texts |
| **CO4** | To write definitions, descriptions, narrations and essays on various topics |
| **CO5** | To interpret non verbal texts |

**Course Code & Course Name: MA3151- Matrices and Calculus**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Use the matrix algebra methods for solving practical problems. |
| **CO2** | Apply differential calculus tools in solving various application problems. |
| **CO3** | Able to use differential calculus ideas on several variable functions. |
| **CO4** | Apply different methods of integration in solving practical problems. |
| **CO5** | Apply multiple integral ideas in solving areas, volumes and other practical problems. |

**Course Code & Course Name: PH3151-ENGINEERING PHYSICS**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Understand the importance of mechanics. |
| **CO2** | Express their knowledge in electromagnetic waves. |
| **CO3** | Demonstrate a strong foundational knowledge in oscillations, optics and lasers. |
| **CO4** | Understand the importance of quantum physics. |
| **CO5** | Comprehend and apply quantum mechanical principles towards the formation of energy bands. |

**Course Code & Course Name:CY3151 Engineering Chemistry**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water. |
| **CO2** | To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications. |
| **CO3** | To apply the knowledge of phase rule and composites for material selection requirements. |
| **CO4** | To recommend suitable fuels for engineering processes and applications. |
| **CO5** | To recognize different forms of energy resources and apply them for suitable applications in energy sectors. |

**Course Code & Course Name:GE3151Problem Solving and Python Programming**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | CO1: Develop algorithmic solutions to simple computational problems. |
| **CO2** | CO2: Develop and execute simple Python programs. |
| **CO3** | CO3: Write simple Python programs using conditionals and loops for solving problems. |
| **CO4** | CO4: Decompose a Python program into functions. |
| **CO5** | CO5: Represent compound data using Python lists, tuples, dictionaries etc. |

**Course Code & Course Name**: **GE3171 Problem Solving and Python Programming Laboratory**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Develop algorithmic solutions to simple computational problems |
| **CO2** | Develop and execute simple Python programs. |
| **CO3** | Implement programs in Python using conditionals and loops for solving problems. |
| **CO4** | Deploy functions to decompose a Python program. |
| **CO5** | Process compound data using Python data structures. |

**Course Code & Course Name**: **BS3171&Physics and Chemistry Laboratory (Physics)**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Understand the functioning of various physics laboratory equipment. |
| **CO2** | Use graphical models to analyze laboratory data. |
| **CO3** | Use mathematical models as a medium for quantitative reasoning and describing physical reality. |
| **CO4** | Access, process and analyze scientific information. |
| **CO5** | Solve problems individually and collaboratively. |

**Course Code & Course Name**: **BS3171&Physics and Chemistry Laboratory (Chemistry)**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO |
| **CO2** | To determine the amount of metal ions through volumetric and spectroscopic techniques |
| **CO3** | To analyse and determine the composition of alloys. |
| **CO4** | To learn simple method of synthesis of nanoparticles |
| **CO5** | To quantitatively analyse the impurities in solution by electroanalytical techniques |

**Course Code & Course Name**: **GE3172- English Laboratory**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To listen to and comprehend general as well as complex academic information |
| **CO2** | To listen to and understand different points of view in a discussion |
| **CO3** | To speak fluently and accurately in formal and informal communicative contexts |
| **CO4** | To describe products and processes and explain their uses and purposes clearly and accurately. |
| **CO5** | To express their opinions effectively in both formal and informal discussions |

# II SEMESTER

**Course Code & Course Name: HS3252 – Professional English II**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To compare and contrast products and ideas in technical texts. |
| **CO2** | To identify and report cause and effects in events, industrial processes through technical texts |
| **CO3** | To analyse problems in order to arrive at feasible solutions and communicate them in the written format. |
| **CO4** | To present their ideas and opinions in a planned and logical manner |
| **CO5** | To draft effective resumes in the context of job search. |

**Course Code & Course Name: MA3251-Statistics and Numerical Methods**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Apply the concept of testing of hypothesis for small and large samples in real life problems. |
| **CO2** | Apply the basic concepts of classifications of design of experiments in the field of agriculture. |
| **CO3** | Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems. |
| **CO4** | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. |
| **CO5** | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications. |

**Course Code & Course Name: PH3254 – Physics for Electronics Engineering**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Know basics of crystallography and its importance for varied materials properties |
| **CO2** | Gain knowledge on the electrical and magnetic properties of materials and their applications |
| **CO3** | Understand clearly of semiconductor physics and functioning of semiconductor devices |
| **CO4** | Understand the optical properties of materials and working principles of various optical devices |
| **CO5** | Appreciate the importance of nanotechnology and nanodevices. |

**Course Code & Course Name: BE3254– Electrical and Instrumentation Engineering**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Explain the working principle of electrical machines |
| **CO2** | Analyze the output characterizes of electrical machines |
| **CO3** | Choose the appropriate electrical machines for various applications |
| **CO4** | Explain the types and operating principles of measuring instruments |
| **CO5** | Explain the basic power system structure and protection schemes |

**Course Code & Course Name:GE3251Engineering Graphics**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Use BIS conventions and specifications for engineering drawing. |
| **CO2** | Construct the conic curves, involutes and cycloid. |
| **CO3** | Solve practical problems involving projection of lines. |
| **CO4** | Draw the orthographic, isometric and perspective projections of simple solids. |
| **CO5** | Draw the development of simple solids. |

**Course Code & Course Name**: **EC3251 Circuit Analysis**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Apply the basic concepts of circuit analysis such as Kirchoff's laws, mesh current and node voltage method for analysis of DC and AC circuits. |
| **CO2** | Apply suitable network theorems and analyze AC and DC circuits |
| **CO3** | Analyze steady state response of any R, L and C circuits |
| **CO4** | Analyze the transient response for any RC, RL and RLC circuits and frequency response of parallel and series resonance circuits. |
| **CO5** | Analyze the coupled circuits and network topologies |

**Course Code & Course Name**: **GE3271 Engineering Practices Laboratory**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work. |
| **CO2** | Wire various electrical joints in common household electrical wire work. |
| **CO3** | Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; |
| **CO4** | Assemble simple mechanical assembly of common householdequipment,Make a tray out of metal sheet using sheet metal work. |
| **CO5** | Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB. |

**Course Code & Course Name**: **EC3271Circuit Analysis Laboratory**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Design RL circuits. |
| **CO2** | Design RC circuits. |
| **CO3** | Verify Thevinin& Norton theorems. |
| **CO4** | Verify KVL & KCL Theorems. |
| **CO5** | Verify Super Position Theorems. |

**Course Code & Course Name**: **GE3272- Communication Laboratory**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Speak effectively in group discussions held in a formal/semi formal contexts. |
| **CO2** | Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions |
| **CO3** | Write emails, letters and effective job applications. |
| **CO4** | Write critical reports to convey data and information with clarity and precision |
| **CO5** | Give appropriate instructions and recommendations for safe execution of tasks |

# III SEMESTER

**Course Code & Course Name:**MA3355Random Processes and Linear Algebra

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To introduce the basic notions of vector spaces which will then be used to solve related problems |
| **CO2** | To understand the concepts of vector space, linear transformations , inner product spaces and orthogonalization.. |
| **CO3** | To provide necessary basic concepts in probability and random processes for applications such as random signals, linear systems in communication engineering. |
| **CO4** | To provide necessary basics in probability that are relevant in applications such as random signals, linear systems in communication engineering. |
| **CO5** | To understand the basic concepts of probability, one and two dimensional random. |

**Course Code & Course Name:**CS3353&C Programming and Data Structures

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Develop C programs for any real world/technical application.. |
| **CO2** | Apply advanced features of C in solving problems. |
| **CO3** | Write functions to implement linear and non–linear data structure operations |
| **CO4** | Suggest and use appropriate linear/non–linear data structure operations for solving a givenproblem. |
| **CO5** | Appropriately use sort and search algorithms for a given application. |

**Course Code & Course Name:**EC3354&Signals and Systems

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Determine if a given system is linear/causal/stable. |
| **CO2** | Determine the frequency components present in a deterministic signal. |
| **CO3** | Characterize continuous LTI systems in the time domain and frequency domain. |
| **CO4** | Characterize discrete LTI systems in the time domain and frequency domain. |
| **CO5** | Compute the output of an LTI system in the time and frequency domains. |

**Course Code & Course Name:**EC3353&Electronic Devices and Circuits

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Explain the structure and working operation of basic electronic devices. |
| **CO2** | Design and analyze amplifiers. |
| **CO3** | Analyze frequency response of BJT and MOSFET amplifiers. |
| **CO4** | Design and analyze feedback amplifiers and oscillator principles. |
| **CO5** | Design and analyze power amplifiers and supply circuit. |

**Course Code & Course Name:**EC3351&Control Systems

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Compute the transfer function of different physical systems. |
| **CO2** | Analyse the time domain specification and calculate the steady state error. |
| **CO3** | Illustrate the frequency response characteristics of open loop and closed loop system response. |
| **CO4** | Analyse the stability using Routh and root locus techniques. |
| **CO5** | Illustrate the state space model of a physical system and discuss the concepts of sampleddata control system |

**Course Code & Course Name:**EC3352&Digital System Design

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Use Boolean algebra and simplification procedures relevant to digital logic. |
| **CO2** | Design various combinational digital circuits using logic gates. |
| **CO3** | Analyse and design synchronous sequential circuits. |
| **CO4** | Analyse and design asynchronous sequential circuits. |
| **CO5** | Build logic gates and use programmable device |

**Course Code & Course Name:**EC3361&Electronic devices and Circuits Laboratory

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Characteristics of PN Junction Diode and Zener diode. |
| **CO2** | Design and Testing of BJT and MOSFET amplifiers.. |
| **CO3** | Operation of power amplifiers |
| **CO4** | Design and analyze feedback amplifiers and oscillator principles. |
| **CO5** | Design and analyze power amplifiers and supply circuit. |

**Course Code & Course Name:**CS3362&C Programming and Data structures Laboratory

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Use different constructs of C and develop applications. |
| **CO2** | Write functions to implement linear and non-linear data structure operations. |
| **CO3** | Suggest and use the appropriate linear / non-linear data structure operations for a given problem. |
| **CO4** | Apply appropriate hash functions that result in a collision free scenario for data storage and Retrieval . |
| **CO5** | Implement Sorting and searching algorithms for a given application. |

# IV SEMESTER

**Course Code & Course Name:**EC3452 Electromagnetic Fields

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Relate the fundamentals of vector, coordinate system to electromagnetic concepts |
| **CO2** | Analyze the characteristics of Electrostatic field |
| **CO3** | Interpret the concepts of Electric field in material space and solve the boundary conditions |
| **CO4** | Explain the concepts and characteristics of Magneto Static field in material space and solve boundary conditions. |
| **CO5** | Determine the significance of time varying fields |

Course Code & Course Name :EC3401 Networks and Security

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Explain the Network Models, layers and functions. |
| **CO2** | Categorize and classify the routing protocols. |
| **CO3** | List the functions of the transport and application layer. |
| **CO4** | Evaluate and choose the network security mechanisms. |
| **CO5** | Discuss the hardware security attacks and countermeasures |

Course Code & Course Name :EC3451 Linear Integrated Circuits

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | : Design linear and nonlinear applications of OP – AMPS |
| **CO2** | Design applications using analog multiplier and PLL |
| **CO3** | Design ADC and DAC using OP – AMPS 80 |
| **CO4** | Generate waveforms using OP – AMP Circuits |
| **CO5** | Analyze special function ICs |

## DEPARTMENT OFELECTRONICS AND COMMUNICATION ENGINEERING

Course Code &Course Name : EC3492 Digital Signal Processing

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Apply DFT for the analysis of digital signals and systems |
| **CO2** | Design IIR and FIR filters |
| **CO3** | Characterize the effects of finite precision representation on digital filters |
| **CO4** | Design multirate filters |
| **CO5** | Apply adaptive filters appropriately in communication systems |

Course Code & Course Name : EC3491Communication Systems

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Gain knowledge in amplitude modulation techniques |
| **CO2** | Understand the concepts of Random Process to the design of communication systems |
| **CO3** | Gain knowledge in digital techniques |
| **CO4** | Gain knowledge in sampling and quantization |
| **CO5** | Understand the importance of demodulation techniques |

Course Code &Course Name : GE3451 Environmental Sciences and Sustainability

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation. |
| **CO2** | To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society. |
| **CO3** | To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations. |
| **CO4** | To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development. |

| | |
|---|---|
| **CO5** | To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization. |

Course Code & Course Name : EC3461 Communication Systems Laboratory

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Design AM, FM & Digital Modulators for specific applications.. |
| **CO2** | Compute the sampling frequency for digital modulation. |
| **CO3** | Simulate & validate the various functional modules of Communication system |
| **CO4** | Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes. |
| **CO5** | Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of Communication system |

Course Code & Course Name :EC3462 Linear Integrated Circuits Laboratory

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Analyze various types of feedback amplifiers |
| **CO2** | :Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators |
| **CO3** | Design and simulate feedback amplifiers,oscillators, tuned amplifiers, wave- shaping circuits and multivibrators, filters using SPICE Tool |
| **CO4** | Design amplifiers, oscillators, D-A converters using operational amplifiers.. |
| **CO5** | Design filters using op-amp and perform an experiment on frequency response |

# V SEMESTER

Course Code & Course Name: EC3501Wireless Communication

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Understand The Concept And Design Of A Cellular System. |
| **CO2** | Understand Mobile Radio Propagation And Various Digital Modulation Techniques |
| **CO3** | Understand The Concepts Of Multiple Access Techniques And Wireless Networks. |
| **CO4** | Characterize a wireless channel and evolve the system design specifications. |
| **CO5** | Design a cellular system based on resource availability and traffic demands |

Course Code & Course Name: EC3552 VLSI And Chip Design

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | In depth knowledge of MOS technology |
| **CO2** | Understand Combinational Logic Circuits and Design Principles |
| **CO3** | Understand Sequential Logic Circuits and Clocking Strategies |
| **CO4** | Understand Memory architecture and building blocks |
| **CO5** | Understand the ASIC Design Process and Testing |

Course Code & Course Name: EC3551 Transmission Lines AndRF Systems

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Explain the characteristics of transmission lines and its losses |
| **CO2** | Calculate the standing wave ratio and input impedance in high frequency transmission lines. |
| **CO3** | Analyze impedance matching by stubs using Smith Charts |
| **CO4** | Comprehend the characteristics of TE and TM waves |
| **CO5** | Design a RF transceiver system for wireless communication |

Course Code & Course Name: CEC365 Wireless Sensor Network Design

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To be able to design solutions for WSNs applications |
| **CO2** | To be able to develop efficient MAC and Routing Protocols |
| **CO3** | To be able to design solutions for 6LOWPAN applications |
| **CO4** | To be able to develop efficient layered protocols in 6LOWPAN |
| **CO5** | To be able to use Tiny OS and Contiki OS in WSNs and 6LOWPAN applications |

Course Code & Course Name: CEC352 Satellite Communication

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Identify the satellite orbits |
| **CO2** | Analyze the satellite subsystems |
| **CO3** | Evaluate the satellite link power budget |
| **CO4** | Identify access technology for satellite |
| **CO5** | Design various satellite applications |

Course Code & Course Name: CEC345 Optical Communication & Networks

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Realize Basic Elements In Optical Fibers, Different Modes And Configurations. |
| **CO2** | Analyze The Transmission Characteristics Associated With Dispersion And Polarization Techniques |
| **CO3** | Design Optical Sources And Detectors With Their Use In Optical Communication System. |
| **CO4** | Construct Fiber Optic Receiver Systems, Measurements And Techniques |
| **CO5** | Design Optical Communication Systems And Its Networks |

Course Code & Course Name:MX3084 Disaster Risk Reduction And Management

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR) |
| **CO2** | To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction |
| **CO3** | To develop disaster response skills by adopting relevant tools and technology |
| **CO4** | Enhance awareness of institutional processes for Disaster response in the country and |
| **CO5** | Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity |

Course Code & Course Name: EC3561 VLSI Laboratory

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Write HDL code for basic as well as advanced digital integrated circuit |
| **CO2** | Import the logic modules into FPGA Boards |
| **CO3** | Synthesize Place and Route the digital Ips |
| **CO4** | Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA tools. |
| **CO5** | Test and Verification of IC design |

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# VI SEMESTER

**Course Code & Course Name:ET3491Embedded Systems and IOT Design**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Learn the architecture and features of 8051 |
| **CO2** | Study the design process of an embedded system. |
| **CO3** | Understand the real – time processing in an embedded system. |
| **CO4** | Learn the architecture and design flow of IoT. |
| **CO5** | Build an IoT based system. |

**Course Code & Course Name:CS3491 ArtificialIntelligence and Machine Learning**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | Study about uninformed and Heuristic search techniques. |
| **CO2** | Learn techniques for reasoning under uncertainty |
| **CO3** | Introduce Machine Learning and supervised learning algorithms |
| **CO4** | Study about ensembling and unsupervised learning algorithms |
| **CO5** | Learn the basics of deep learning using neural networks |

**Course Code & Course Name:CEC334 Analog IC Design**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To study the basics of MOS Circuits |
| **CO2** | To analyse the noise characteristics of amplifiers. |
| **CO3** | To study the performance parameters of amplifiers |
| **CO4** | To comprehend the compensation techniques |
| **CO5** | To understand the detection and testing of faults. |

**Course Code & Course Name:CEC348 Remote Sensing**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To understand the principles of electromagnetic radiation. |
| **CO2** | To learn the atmospheric radiation interactions. |
| **CO3** | To study the laws of planetary motion |
| **CO4** | To classify the different types of resolution |
| **CO5** | To know the concepts of digital interpretation |

**Course Code & Course Name:MX3089 Industrial Safety**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To Understand the Introduction and basic Terminologies safety. |
| **CO2** | To enable the students to learn about the Important Statutory Regulations and standards |
| **CO3** | To enable students to Conduct and participate the various Safety activities in the Industry. |
| **CO4** | To have knowledge about Workplace Exposures and Hazards. |
| **CO5** | To assess the various Hazards and consequences through various Risk Assessment Techniques |

**Course Code & Course Name:OEE351 Renewable EnergySystem**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

| | |
|---|---|
| **CO1** | To Provide knowledge about various renewable energy technologies |
| **CO2** | To enable students to understand and design a PV system. |
| **CO3** | To provide knowledge about wind energy system. |
| **CO4** | To Provide knowledge about various possible hybrid energy systems |
| **CO5** | To gain knowledge about application of various renewable energy technologies |