



SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

An UGC Autonomous Institution, Accredited by NAAC with A+ Grade

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Sheriguda(Vill), Ibrahimpatnam(Mdl), R. R. Dist – 501510

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COURSE OUTCOMES (COs)

Course Outcomes (COs) describe what students can able to do after completion of the course.

Program : B.Tech-Electronics and Communication Engineering	Academic Year : 2021-22	Semester : I & II
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S.No	Year/Sem	Course Code	Course Name	Course Outcomes (After completion of the course student can able to :)
1	II/I	EC301PC	Electronic Devices and Circuits	CO1: Describe the applications of diode as rectifier, clippers, and clamper circuits.
				CO2: Design various switching devices such as transistor, transistor biasing.
				CO3: Analyse the operation of FET, special devices like Zener, Tunnel, Varactor diode, UJT and SCR.
				CO4: Define explain transistor hybrid model.
				CO5: Draw the operation of small signal model FET operation.
				CO6: Explain the operation of diodes, BJT, FET, Transistor amplifiers.
2	II/I	EC302PC	Network Analysis and Transmission Lines	CO1: Gain the knowledge on basic network elements and magnetic circuits.
				CO2: Analyze the RLC circuits in detail.
				CO3: Gain the knowledge in characteristics of two port network parameters (Z, Y, ABCD, H & G).
				CO4: Gain the knowledge in network function driving point in transfer function using s variables, poles and zeros.
				CO5: Analyze the transmission line parameters and configurations.
				CO6: Analyze smith chart configuration & applications.
3	II/I	EC303PC	Digital System Design	CO1: State the Boolean algebra, different number systems and codes. Change one number system into another number system.
				CO2: Design the different combinational logic circuits. Modify and transform one form of Boolean equation to another form and simplify the Boolean equation in K-Map.



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				<p>CO3: Design the different Sequential circuits. Analyze and compare the flipflops and transform one flipflop to another flipflop.</p> <p>CO4: Design synchronous and asynchronous counters. Analyze and differentiate the sequential machine.</p> <p>CO5: Define, Differentiate between logic families and realization of logic gates using diodes and transistors</p> <p>CO6: Design the digital system.</p>
4	II/I	EC304PC	Signals and Systems	<p>CO1: Explain any arbitrary signals in terms of complete sets of orthogonal functions and understands the principles of impulse functions, step function and signum function.</p> <p>CO2: Express periodic signals in terms of Fourier series and express the spectrum and express the arbitrary signal (discrete) as Fourier transform to draw the spectrum.</p> <p>CO3: Analyze the characteristics of linear time invariant systems.</p> <p>CO4: Explain response can be obtained using Laplace transform and Z- Transform, properties and ROC of L.T and Z- Transform.</p> <p>CO5: Analyze the Sampling theorem, reconstruction, aliasing, and Nyquist's theorem to represent continuous time signals in discrete time.</p> <p>CO6: Compare auto Correlation and cross correlation and concept of power density spectrum.</p>
5	II/I	EC305ES	Probability Theory and Stochastic Processes	<p>CO1: Attain the knowledge of Probability theory and random variables.</p> <p>CO2: Explain the Vector Random variables and joint distribution function.</p> <p>CO3: Understand the response of linear time Invariant system for a Random Processes.</p> <p>CO4: Analyze the random variable and random process, its properties.</p> <p>CO5: Determine the Spectral and temporal characteristics of Random Signals.</p> <p>CO6: Analyze the concepts of Noise in Communication systems.</p>



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6	II/I	EC306PC	Electronic Devices and Circuits Lab	CO1: Describe the applications of diode as rectifier, clippers and clamper circuit.
				CO2: Design various switching devices such as transistor, transistor biasing.
				CO3: Analyze the operation of FET, Special devices like Zener, Tunnel. Varactor diode, UJT, SCR.
				CO4: Define explain transistor hybrid model.
				CO5: Draw the operation of small signal model FET operation.
				CO6: Examine the operation of diodes, BJT, FET, Transistor amplifiers.
7	II/I	EC307PC	Digital System Design Lab	CO1: Identify the IC configurations of digital circuits.
				CO2: Verify and compare different types of gates and comparators.
				CO3: Develop the clock using universal gates.
				CO4: Design and realization of sequential circuits.
				CO5: Analyze and implementation of sequential circuits.
				CO6: Compare combinational and sequential circuits.
8	II/I	EC308ES	Basic Simulation Lab	CO1: Identify the basic operations on matrices.
				CO2: Identify and Analyze the various signals and sequences.
				CO3: Point out even and odd signals and real and imaginary parts of signals.
				CO4: Construct the convolution for signals and sequence, Linear-Non linear and time variant-Invariant of sequences.
				CO5: Compare the auto correlation, cross correlation.
				CO6: Describe sampling.
9	II/I	*MC309	Constitution of India	CO1: Understand meaning, features, characteristics of constitution law and constitutionalism.
				CO2: Describe fundamental rights, fundamental duties and its legal status.
				CO3: Describe The constitution powers and status of the President of India.
				CO4: Understand Emergency Provisions: National Emergency, President Rule, And Financial Emergency.
				CO5: Understand Fundamental Right to Equality, Fundamental Right to certain Freedom under Article 19.
				CO6: Describe the Scope of the Right to Life and



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				Personal Liberty under Article 21.
10	II/II	MA401BS	Laplace Transforms, Numerical Methods & Complex Variables	CO1: Describe the use of Laplace Transform techniques when solving ordinary differential equations.
				CO2: Solve the polynomial and transcendental equations.
				CO3: Determine the Numerical solutions for given ordinary differential equations.
				CO4: Identify the Differential Numerical Methods.
				CO5: Describe the Complex function with their analyticity, integration using Cauchy's Integral and Residue theorems.
				CO6: Discuss the Taylor's and Laurent series expansions.
11	II/II	EC402PC	Electromagnetic Fields and Waves	CO1: Apply the basic laws to derive the Maxwell's Equation in Differential and Integral form for solving the engineering problems in Electrostatics.
				CO2: Describe the knowledge of Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law.
				CO3: Distinguish between static and Time varying fields, apply these concepts to derive the Maxwell's Equation in Differential, Integral form and boundary conditions for solving the engineering problems.
				CO4: Analyze the wave equation for good conductors and good dielectrics, criticize and apply the characteristics of uniform plane wave for practical problems.
				CO5: To analyze the characteristics of Uniform Plane Waves (UPW), determine their propagation parameters and estimate the same for dielectric and dissipative media.
				CO6: Analyze the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems.
12	II/II	EC403PC	Analog and Digital Communications	CO1: Design various continuous wave modulation and demodulation techniques.
				CO2: Analyze Frequency Modulation (FM) Techniques.
				CO3: Analyze Phase Modulation (PM) Techniques.
				CO4: Design various AM and FM transmitters.
				CO5: Describe various Pulse Modulation Techniques.



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				CO6: Analyze various digital modulation techniques and baseband transmission.
13	II/II	EC404PC	Linear IC Applications	CO1: Describe the characteristics of Operational Amplifier with linear integrated circuits.
				CO2: Analyze the different applications of Operational Amplifier.
				CO3: Produce the different wave forms of filters and oscillators.
				CO4: Describe the functional diagrams and applications of IC 555 & IC 565.
				CO5: Explain various techniques to design analog to digital converters and digital to analog converters.
				CO6: Design the linear integrated circuits using operational Amplifier.
14	II/II	EC405PC	Electronic Circuit Analysis	CO1: Design the multistage amplifiers and develop & analyze transistor amplifier circuits using Hybrid π model at high frequencies.
				CO2: Design of Feedback amplifiers and their frequency response.
				CO3: Understand the design of various oscillators such as RC Phase Shift Oscillator, Wein Bridge Oscillator, Crystal, LC oscillator.
				CO4: Design and compare various Power amplifiers such as Class A, Class B, Class AB amplifiers, Analysis of various tuned amplifiers etc.
				CO5: Design Multivibrators.
				CO6: Understand sweep circuits for various applications.
15	II/II	EC406PC	Analog and Digital Communications Lab	CO1: Identify the basics of analog and digital communication systems.
				CO2: Design and Implement different modulation and demodulation techniques.
				CO3: Analyze and implement analog to digital, digital to analog converters.
				CO4: Describe practical implementation of baseband modulation techniques.
				CO5: Design and implement different pulse modulation techniques like PAM, PWM and PPM.
				CO6: Compare analog and digital modulation techniques.
16	II/II	EC407PC	IC Applications Lab	CO1: Design inverting and non inverting, adder and subtractor or amplifier using op-amp.
				CO2: Verify a comparator, Integrator and Differentiator using op-amp and voltage regulator using IC723.



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				<p>CO3: Design active filters, PLL.</p> <p>CO4: Analysis of IC741 waveform generator sine, square, triangular waves.</p> <p>CO5: Design a Monostable, Astable Multivibrator and Schmitt trigger.</p> <p>CO6: Identify and verify the functionalities of the linear integrated circuits.</p>
17	II/II	EC408PC	Electronic Circuit Analysis Lab	<p>CO1: Design and simulate different BJT amplifiers: CE amplifier, Two stage RC coupled amplifier, Cascode, Darlington pair.</p> <p>CO2: Design and simulate feedback amplifiers: Current shunt feedback amplifier, Voltage series feedback amplifiers.</p> <p>CO3: Design and simulate different oscillators: RC phase shift oscillator, Hartley and colpitt's oscillators.</p> <p>CO4: Design and simulate power amplifiers: Class A power amplifier, Class B complementary symmetry amplifier.</p> <p>CO5: Design Monostable Multivibrator.</p> <p>CO6: Design Miller sweep circuit.</p>
18	II/II	*MC409	Gender Sensitization Lab	<p>CO1: Develop sensibility with regard to issues of gender in contemporary India.</p> <p>CO2: Provide a critical perspective on the socialization of men and women.</p> <p>CO3: Determine information about some key biological aspects of genders.</p> <p>CO4: Debate on the politics and economics of work.</p> <p>CO5: Reflect critically on gender violence.</p> <p>CO6: Expose more egalitarian interactions between men and women.</p>
19	III/I	EC501PC	Microprocessors & Microcontrollers	<p>CO1: Basic understanding of 8086 microprocessors architectures and its functionalities.</p> <p>CO2: Design and develop 8086 Microprocessor based systems for real time applications using low level language like ALP.</p> <p>CO3: Basic understanding of 8051 microcontroller's architectures and its functionalities.</p> <p>CO4: Discuss the input /output memory interface Serial Communication and Bus Interface device.</p> <p>CO5: Analyze the internal architecture of ARM.</p> <p>CO6: Classify the internal architecture of CORTEX ARM Processor and MAP ARM Processor.</p>



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20	III/I	EC502PC	Data Communications and Networks	<p>CO1: Explain conceptual foundation for study of data communication using layered architecture.</p> <p>CO2: Analyze network Interface protocol and Design Performance issues in MAC in DLL.</p> <p>CO3: Evaluate the functioning of routing algorithm and internetworking.</p> <p>CO4: Analyze reliable transmission and analyze the performance of TCP protocols.</p> <p>CO5: Demonstrate the significance of various flow control and congestion control mechanisms.</p> <p>CO6: Analyze the features and operation of various application layer protocols such as Http, DNS &STMP.</p>
21	III/I	EC503PC	Control Systems	<p>CO1: Create mathematical model using Laplace Transform and define the Transfer Function of an LTI system in various ways.</p> <p>CO2: Analyze the response of First and second order systems in time domain using characteristic Equations for feedback control systems, and also evaluate the stability of a system in Time Domain using RH Criterion and Root Locus.</p> <p>CO3: Examine Frequency response analysis of a Control System and Solve the stability of the system using BODE Plots.</p> <p>CO4: Analyze the stability of a system in frequency domain using polar and Nyquist's plots.</p> <p>CO5: Design and implementation of Compensators and Controllers to improve stability.</p> <p>CO6: Design state model of a system and determine the transfer function for Linear Time Variant Systems.</p>
22	III/I	SM504MS	Business Economics & Financial Analysis	<p>CO1: The students will understand various forms of Business and the impact of economic variables on the business.</p> <p>CO2: Understand the significance of elasticity of demand and its forecasting, law of demand and its exceptions and supply analysis.</p> <p>CO3: Understand production analysis function with different variables and cost analysis functions.</p> <p>CO4: To adopt the principles of accounting to record, classify and summarize various transactions in books of accounts for preparation of final accounts.</p> <p>CO5: Understand the Ratio analysis to give an idea about financial forecasting, financial planning, controlling and decision making.</p> <p>CO6: Understand the implementation of different structures of markets.</p>



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23	III/I	EC513PE	Electronic Measurements and Instrumentation (PE- I)	CO1: Analyze the various electronic instruments based on their specifications for carrying out a particular task of measurements.
				CO2: Explain the various types of signal generators, signal analyzers for generating and analyzing various real time signals.
				CO3: Define the different types of oscilloscopes and the characteristics of the signals.
				CO4: Compare different types of transducer like piezoelectric and magneto strictive Transducers.
				CO5: Define and distinguish the types of bridges and measuring the physical parameters like Humidity, moisture, velocity and force.
				CO6: Relate the use of measuring instruments in real time applications.
24	III/I	EC505PC	Microprocessors & Microcontrollers Lab	CO1: Basic understanding of 8086 microprocessors architectures and its functionalities.
				CO2: Design and develop 8086 Microprocessor based systems for real time applications using low level language like ALP.
				CO3: Basic understanding of 8051 microcontroller's architectures and its functionalities.
				CO4: Discuss the input /output memory interface Serial Communication and Bus Interface device.
				CO5: Analyze the internal architecture of ARM.
				CO6: Classify the internal architecture of CORTEX ARM Processor and MAP ARM Processor.
25	III/I	EC506PC	Data Communications and Networks Lab	CO1: Explain conceptual foundation for study of data communication using layered architecture.
				CO2: Analyze network Interface protocol and Design Performance issues in MAC in DLL.
				CO3: Evaluate the functioning of routing algorithm and internetworking.
				CO4: Analyze reliable transmission and analyze the performance of TCP protocols.
				CO5: Demonstrate the significance of various flow control and congestion control mechanisms.
				CO6: Analyze the features and operation of various application layer protocols such as Http, DNS &STMP.
				CO1: Speak effectively.
				CO2: Express and communicate fluently and



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26	III/I	EN508HS	Advanced Communication Skills Lab	<p>appropriately in social professional contexts.</p> <p>CO3: Develop the comprehensive ability through English language enables the students in understanding and assimilating other engineering subjects.</p> <p>CO4: The awareness of English lab enriches their communication and soft skills contributing to their overall development and success.</p> <p>CO5: Draft various letters and reports for all official purpose.</p> <p>CO6: Take part in social and professional communication.</p>
27	III/I	*MC510	Intellectual Property Rights	<p>CO1: Understand different types of intellectual property.</p> <p>CO2: Analyze purpose, functions, selection and evaluation of Trade Marks.</p> <p>CO3: Explain law of copy rights.</p> <p>CO4: Explain law of patents.</p> <p>CO5: Understand trade secret, Trade secret status and trade secret litigation.</p> <p>CO6: Identify new developments in intellectual property.</p>
28	III/II	EC601PC	Antennas and Propagation	<p>CO1: Characterize the antennas based on frequency.</p> <p>CO2: Identify the antenna array patterns.</p> <p>CO3: Understand the concept of antenna measurements.</p> <p>CO4: Design VHF, UHF and microwave antennas.</p> <p>CO5: Analyze micro strip antennas.</p> <p>CO6: Characterize different wave propagations.</p>
29	III/II	EC602PC	Digital Signal Processing	<p>CO1: Understand the LTI system characteristics and Multi rate signal processing.</p> <p>CO2: Understand the inter-relationship between DFT and various transforms.</p> <p>CO3: Design IIR digital filters for a given specification.</p> <p>CO4: Design FIR digital filters for a given specification.</p> <p>CO5: Express Z -transform analysis on signals and systems.</p> <p>CO6: Understand the significance of various filter structures and effects of round off errors.</p>
30	III/II	EC603PC	VLSI Design	<p>CO1: Acquire knowledge of the Fabrication of IC using various MOS circuits and can be able to compute electrical properties of MOS circuits.</p> <p>CO2: Understand vlsi design flow and design rules for</p>



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				<p>layout of IC.</p> <p>CO3: Design various gates, adders, Multipliers and Memories using stick diagrams, layouts.</p> <p>CO4: Design various forms of memories.</p> <p>CO5: Demonstrate semiconductor IC design such as PLA 's, PAL, FPGA, CPLDs.</p> <p>CO6: Understand differential strategies for testing of IC's and CMOS.</p>
31	III/II	EC613PE	Embedded System Design (PE-II)	<p>CO1: Describe the basics of an embedded system.</p> <p>CO2: Interpret the types of memory and interfacing to external world.</p> <p>CO3: Analyze the embedded firmware design approaches.</p> <p>CO4: Design the RTOS based embedded system for multitasking.</p> <p>CO5: Express the task communication/synchronization issues.</p> <p>CO6: Assess the method of designing an embedded system for any type of application.</p>
32	III/II	MT600OE	Industrial Management (OE-I)	<p>CO1: Write the concepts of management and organization and explain the management theories.</p> <p>CO2: Explain principles and types of plant layout and stores management and stores record.</p> <p>CO3: Explain functions of management, marketing mix and marketing strategies.</p> <p>CO4: What is HRM and Human Resource Planning, Recruitment and selection, Training & Development.</p> <p>CO5: Solve network analysis and identify critical path and project crashing using PERT and CPM methods.</p> <p>CO6: What is strategic management and contemporary strategic issues.</p>
33	III/II	EC604PC	Digital Signal Processing Lab	<p>CO1: Apply knowledge of digital filter design for various applications.</p> <p>CO2: Analyze various signals in transform domain.</p> <p>CO3: Apply MultiMate concepts in different areas.</p> <p>CO4: Perform real time experiments on processors such as audio and speak processing.</p> <p>CO5: Work with MATLAB functions.</p> <p>CO6: Analyze and design different signals & filters using MATLAB.</p>
34	III/II	EC605PC	e – CAD Lab	<p>CO1: Realize all the logic gates.</p> <p>CO2: Design different types of encoders and decoders</p> <p>CO3: Differentiate multiplexers and demultiplexers.</p> <p>CO4: Design converters.</p> <p>CO5: Analyze adders and subtractions.</p>



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				CO6: Design different types of flip flops & Counters.
35	III/II	EC606PC	Scripting Languages Lab	CO1: Understand the difference between scripting languages and programming languages.
				CO2: Gain some fluency programming in Ruby, Perl, TCL.
				CO3: Write different scripts on numbers and strings.
				CO4: Understand different functions in Perl Program.
				CO5: Gain knowledge on list operations using TCL.
				CO6: Gain knowledge on routines in scripting language.
36	III/II	*MC609	Environmental Science	CO1: Understand ecological principles.
				CO2: Evaluate environmental regulations.
				CO3: Classify the natural resources.
				CO4: Differentiate Biodiversity and Biotic resources.
				CO5: Describe environmental pollution control techniques.
				CO6: Gain knowledge on environmental protection Act.
37	IV/I	EC701PC	Microwave and Optical Communications	CO1: Recognize the microwave bands, applications and rectangular waveguides.
				CO2: Analyze the waveguide components and cavity resonators.
				CO3: Classify O type and M type microwave tubes.
				CO4: Explain the microwave solid state devices and applications.
				CO5: Illustrate microwave measurements by using microwave bench.
				CO6: Describe the significance of microwave transmission lines and wave guides.
38	IV/I	EC713PE	Digital Image Processing (PE–III)	CO1: Define digital image fundamentals, sampling and quantization, relationship between pixels, different types of image transforms.
				CO2: Design concepts including the topics of filtering and types of operations.
				CO3: Solve the derivations of different types of restoration filters.
				CO4: Compare different types of segmentation and morphing concepts.
				CO5: Classify compression models and their redundancies.
				CO6: Have the skill base summary to further explore advance the topics of digital image processing.
				CO1: Understand various attacks on the network and understanding the need for security.



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39	IV/I	EC723PE	Network Security and Cryptography (PE- IV)	CO2: Apply various classical encryption techniques on messages and analyze various security services and mechanisms.
				CO3: Compare and contrast symmetric and asymmetric key cryptographic systems.
				CO4: Describe the cryptographic hash functions, message authentication codes and various key management and distribution techniques.
				CO5: Explain different protocols like SSL, TLS, HTTPS, SSH and various wireless network standards.
				CO6: Analyze how PGP and S/MIME is used to protect messages transmitted through E- Mail and explains IPSEC.
40	IV/I	CS703OE	Java Programming (OE- II)	CO1: Understand object oriented thinking and java basics.
				CO2: Gain the knowledge of Inheritance, Packages and Interfaces in Java programming.
				CO3: Explain about exception handling.
				CO4: Describe multithreading.
				CO5: Understand Event Handling.
41	IV/I	SM702MS	Professional Practice, Law & Ethics	CO1: Define Professional Ethics.
				CO2: Understand law of contract and essential elements of valid contract.
				CO3: Describe Arbitration, Conciliation and ADR system.
				CO4: Explain the importance of Dispute Resolution Boards like Lok Adalats.
				CO5: Differentiate construction related laws.
42	IV/I	EC703PC	Microwave and Optical Communications Lab	CO1: Recognize the microwave bands, applications and rectangular waveguides.
				CO2: Analyze the waveguide components and cavity resonators.
				CO3: Classify O type and M type microwave tubes.
				CO4: Explain the microwave solid state devices and applications.
				CO5: Illustrate microwave measurements by using microwave bench.
				CO6: Describe the significance of microwave transmission lines and wave guides.
				CO1: Analyze new problems, identify and define the appropriate requirements for their solutions.



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43	IV/I	EC704PC	Industrial Oriented Mini Project	CO2: Understand team work to complete to reach the target.
				CO3: Learn new technologies in the engineering fields.
44	IV/I	EC705PC	Seminar	CO1: Express public speaking during presentations.
				CO2: Analyze new technologies in all engineering fields.
				CO3: Effectively communicate by making an oral presentation.
45	IV/I	EC706PC	Project Stage-I	CO1: Analyze new problems, identify and define the appropriate requirements for their solutions.
				CO2: Understand team work to complete to reach the target.
				CO3: Learn new technologies in the engineering fields.
46	IV/II	EC811PE	Satellite Communications (PE- V)	CO1: Obtain different types of satellites and to calculate the orbital determination and launching methods.
				CO2: Develop commands, monitoring power systems.
				CO3: Calculate multiple access techniques like TDMA,CDMA,FDMA,DAMA.And design antennas to provide uplink and down link frequency.
				CO4: Design different kinds of transmitter and receiver antennas.
				CO5: Demonstrate the impacts of GPS, Navigation, NGSO and constellation design for tracking and launching.
				CO6: Design satellite for real time applications.
47	IV/II	EC823PE	Low Power VLSI Design (PE-VI)	CO1: Carry out research and development in the area of Low Power VLSI circuits.
				CO2: Apply techniques to improve power consumption of VLSI circuits.
				CO3: Utilize logic simulation methods to design Low Power VLSI circuits.
				CO4: Apply logic level, architecture level and system level techniques in various designs to optimize power consumption of the VLSI circuits.
				CO5: Known the design of Low voltage Low power memories.
				CO6: Implement practical and state of the art Low Power VLSI design , Suitable for real life and industry applications.
48	IV/II	CS800OE	Machine Learning (OE-III)	CO1: Understand decision tree learning.
				CO2: Understand Artificial Neural Networks.
				CO3: Analyze Bayesian learning.



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				CO4: Implement Computational learning theory.
				CO5: Learn set of rules in learning.
				CO6: Understand Analytical learning.
49	IV/II	EC801PC	Project Stage - II	CO1: Analyze new problems, identify and define the appropriate requirements for its solutions.
				CO2: Understand of the impact of engineering solutions.
				CO3: Understand team work to complete a common goal.


HOD/ECE


PRINCIPAL