



AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, Recg. By Govt. of T.S. & Affiliated to JNTUH, Hyderabad)

NAAC "B++" Accredited Institute

Gunthapally (V), Abdullapurmet (M), RR Dist, Near Ramoji Film City, Hyderabad - 501512.

www.aietg.ac.in email: principal.avanthi@gmail.com

2.6.1 Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the Institution are stated and displayed on website and attainment of POs and COs are evaluated.

PO.1.Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO.2.Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO.3.Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO.4.Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO.5.Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO.6.The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO.7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO.8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO.9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO.10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO.11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.



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PO.12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.


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Electronics and Communication Engineering I & II SEM Course Outcomes For the A.Y 2022-23

S.no	Year/Sem	Course Name	Course Outcomes
1	II-I	ELECTRONIC DEVICES AND CIRCUITS	CO1: Know the characteristics of various components.
			CO2: Understand the utilization of components.
			CO3: Understand the biasing techniques
			CO4: Design and analyze small signal amplifier circuits.
2	II-I	NETWORK ANALYSIS AND TRANSMISSION LINES	CO1: Gain the knowledge on basic RLC circuits behavior.
			CO2: Analyze the Steady state and transient analysis of RLC Circuits
			CO3: Know the characteristics of two port network parameters
			CO4: Analyze the transmission line parameters and configurations.
3	II-I	DIGITAL SYSTEM DESIGN	CO1: Understand the numerical information in different forms and Boolean Algebra theorems
			CO2: Postulates of Boolean algebra and to minimize combinational functions
			CO3: Design and analyze combinational and sequential circuits
			CO4: Known about the logic families and realization of logic gates.
4	II-I	SIGNALS AND SYSTEMS	CO1: Differentiate various signal functions
			CO2: Represent any arbitrary signal in time and frequency domain.
			CO3: Understand the characteristics of linear time invariant systems.
			CO4: Analyze the signals with different transform technique
5	II-I	PROBABILITY AND STOCHASTIC PROCESSES	CO1: Understand the concepts of Random Process and its Characteristics
			CO2: Understand the response of linear time Invariant system for a Random Processes.
			CO3: Determine the Spectral and temporal characteristics of Random Signals
			CO4: Understand the concepts of Noise in Communication systems.

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6	II-I	ELECTRONIC DEVICES AND CIRCUITS LAB	CO1:Ability to analyze PN junctions in semiconductor devices under various conditions.
			CO2:Ability to design and analyze simple rectifiers and voltage regulators using diodes.
			CO3:Ability to describe the behavior of special purpose diodes.
			CO4:Ability to design and analyze simple BJT and MOSFET circuits.
7	II-I	DIGITAL SYSTEMS DESIGN LAB	CO1: Apply the concept of Boolean algebra to verify the truth table of various expressions
			CO2 :Make use of dataflow, structural and behavioral modeling styles of HDL for
			CO3:Analyze the SR flip flop, JK flip flop, D flip flop, T flip flops for functional
			CO4:Build the universal shift registers, counters using the flip flops
			CO5:Examine a finite state machine for detection of sequence.
			CO6:Design the real time applications like traffic light controller, chess clock controller
8	II-I	BASIC SIMULATION LAB	CO1:Acquainted with MATLAB commands, functions and programming
			CO2:Generate various signals and sequences in MATLAB and perform operations on them.
			CO3:Determine the Convolution and Correlation between Signals and Sequences.
			CO4:Verify the properties of a given Continuous/Discrete System and Sampling theorem
			CO5:Determine the Laplace and Fourier Transform of the given signal.
			CO6: Determine LTI system response.
9	II-I	CONSTITUTION OF INDIA	CO1:To realise the significance of constitution of India to students from all walks of life and
			CO2:To identify the importance of fundamental rights as well as fundamental duties
			CO3:To understand the functioning of Union, State and Local Governments in Indian federal
			CO4:To learn procedure and effects of emergency, composition and activities of election
10	II-II	LAPLACE TRANSFORMS, NUMERICAL METHODS AND COMPLEX VARIABLES	CO1: Use the Laplace transforms techniques for solving ODE's
			CO2:Estimate the value for the given data using interpolation
			CO3:Estimate the value for the given data using interpolation
			CO4: CO4:Find the numerical solutions for a given ODE's
			CO5:Analyze the complex function with reference to their analyticity, integration using Cauchy's
			CO6:integral and residue theorems Taylor's and Laurent's series expansions of complex function

11	II-II	ELECTROMAGNETIC FIELDS AND WAVES	CO1: Get the knowledge of Basic Laws, Concepts and proofs related to Electrostatic Fields and
			CO2: Distinguish between the static and time-varying fields, establish the corresponding sets of
			CO3: Analyze the Wave Equations for good conductors, good dielectrics and evaluate the
			CO4: To analyze completely the rectangular waveguides, their mode characteristics, and
12	II-II	ANALOG AND DIGITAL COMMUNICATION	CO1: Analyze and design of various continuous wave and angle modulation and demodulation
			CO2: Understand the effect of noise present in continuous wave and angle modulation techniques.
			CO3: Attain the knowledge about AM, FM Transmitters and Receivers
			CO4: Analyze and design the various Pulse Modulation Techniques
			CO5: Understand the concepts of Digital Modulation Techniques and Baseband transmission.
13	II-II	ELECTRONIC CIRCUIT ANALYSIS	CO1: Design the multistage amplifiers and understand the concepts of High Frequency Analysis of
			CO2: Utilize the Concepts of negative feedback to improve the stability of amplifiers and positive
			CO3: Design and realize different classes of Power Amplifiers and tuned amplifiers useable for
			CO4: Design Multivibrators and sweep circuits for various applications
14	II-II	LINEAR IC APPLICATIONS	CO1: A thorough understanding of operational amplifiers with linear integrated circuits
			CO2: Attain the knowledge of functional diagrams and applications of IC 555 and IC 565
			CO3: Acquire the knowledge about the Data converters
15	II-II	ANALOG AND DIGITAL COMMUNICATION LAB	CO1: Design and implement various Analog modulation and demodulation Techniques and observe
			CO2: Design and implement various Pulse modulation and demodulation Techniques and observe
			CO3: Apply different types of Sampling with various Sampling rates and duty Cycles
			CO4: Design and implement various Digital modulation and demodulation Techniques and observe
16	II-II	IC APPLICATION LAB	CO1: Design and implementation of various analog circuits using 741 Ics
			CO2: Design and implementation of various Multivibrators using 555 timer.
			CO3: Design and implement various circuits using digital Ics
			CO4: Design and implement ADC, DAC and voltage regulators.

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17	II-II	ELECTRONIC CIRCUIT ANALYSIS LAB	CO1:The ability to analyze and design single and multistage amplifiers at low, mid and high
			CO2: Designing and analyzing the transistor at high frequencies.
			CO3:Determine the efficiencies of power amplifiers
			CO4:Designing the Oscillators using transistors
			CO5:Determine Frequency response and design of tuned amplifiers.
			CO6:Able to Analyze all the circuits using simulation software and Hardware.
18	II-II	GENDER SENSITIZATION LAB	CO1:Students will have developed a better understanding of important issues related to gender in
			CO2:Students will be sensitized to basic dimensions of the biological, sociological, psychological and
			CO3:Students will attain a finer grasp of how gender discrimination works in our society and how to
			CO4:Students will acquire insight into the gendered division of labour and its relation to politics and
			CO5:Men and women students and professionals will be better equipped to work and live together as
19	III-I	MICROPROCESSORS AND MICRO CONTROLLERS	CO1:Understands the internal architecture, organization and assembly language programming of
			CO2:Understands the internal architecture, organization and assembly language programming of
			CO3:Understands the interfacing techniques to 8086 and 8051 based systems
			CO4:Understands the internal architecture of ARM processors and basic concepts of advanced ARM
20	III-I	DATA COMMUNICATIONS AND NETWORKS	CO1:Know the Categories and functions of various Data communication Networks
			CO2:Design and analyze various error detection techniques.
			CO3:Demonstrate the mechanism of routing the data in network layer
			CO4:Know the significance of various Flow control and Congestion control Mechanisms
			CO5:Know the Functioning of various Application layer Protocols.
21	III-I	CONTRPOL SYSTEMS	CO1:Understand the modeling of linear-time-invariant systems using transfer function and statespace
			CO2:Understand the concept of stability and its assessment for linear-time invariant systems.
			CO3:Design simple feedback controllers.
22	III-I	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	CO1:The students will understand the various Forms of Business and the impact of
			CO2: The Demand, Supply, Production, Cost, Market Structure, Pricing
			CO3:The Students can study the firm's financial position by analysing the Financial


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23	III-I	COMPUTER ORGANIZATION AND OPERATING SYSTEMS	CO1:Able to visualize the organization of different blocks in a computer.
			CO2: Able to use micro-level operations to control different units in a computer.
			CO3:Table to use Operating systems in a computer.
24	III-I	ERROR CORRECTING CODES	CO1:Able to transmit and store reliable data and detect errors in data through coding.
			CO2: Able to understand the designing of various codes like block codes, cyclic codes, convolution
25	III-I	ELECTRONIC MEASUREMENT AND INSTRUMENTATION	CO1:Measure electrical parameters with different meters and understand the basic definition of
			CO2: Use various types of signal generators, signal analyzers for generating and analyzing various
			CO3:Operate an Oscilloscope to measure various signals.
			CO4: Measure various physical parameters by appropriately selecting the transducers.
26	III-I	MICROPROCESSORS AND MICRO CONTROLLERS LAB	CO1:The student will learn the internal organization of popular 8086/8051
			CO2:The student will learn hardware and software interaction and integration.
			CO3:To apply the concepts in the design of microprocessor/microcontroller based systems in real
27	III-I	DATA COMMUNICATIONS AND NETWORKS LAB	CO1:Understand the structure and organization of computer networks; including the division into
			CO2:Understand the basic concepts of application layer protocol design; including client/server
			CO3:In depth understanding of transport layer concepts and protocol design; including connection
28	III-I	ADVANCED COMMUNICATION SKILLS LAB	CO1:To improve the students' fluency in English, through a well-developed vocabulary and enable
			CO2:Further, they would be required to communicate their ideas relevantly and coherently in writing.
			CO3:To prepare all the students for their placements
29	III-I	INTELLECTUAL PROPERTY RIGHTS	CO1:It allows students how to prepare and protect the Inventions , start up ideas and rights of patents
			CO2:Students get the knowledge on Trademarks and Trade Secrets.
			CO3This subject brings awareness to the students on the various types of Unfair Competition and the
			CO4:Student gets. Awareness of Cyber laws and Cyber Crime, to protect the data from Cyber crime.
			CO5:Summarize the Intellectual property rights globally and exposure to the emerging trends In IPR.

30	III-II	ANTENNAS AND PROPAGATION	CO1:Characterize the antennas based on frequency, configure the geometry and establish the
			CO2:Specify the requirements for microwave measurements and arrange a setup to carry out the
			CO3:Classify the different wave propagation mechanisms, determine the characteristic features of
31	III-II	DIGITAL SIGNAL PROCESSING	CO1:Understand the LTI system characteristics and Multirate signal processing.
			CO2:Understand the inter-relationship between DFT and various transforms
			CO3:Design a digital filter for a given specification.
			CO4:Understand the significance of various filter structures and effects of round off errors.
32	III-II	VLSI DESIGN	CO1:Acquire qualitative knowledge about the fabrication process of integrated circuits using MOS
			CO2:Draw the layout of any logic circuit which helps to understand and estimate parasitic effect of any
			CO3:Design building blocks of data path systems, memories and simple logic circuits using PLA,
			CO4:Understand different types of faults that can occur in a system and learn the concept of testing and
33	III-II	OBJECT ORIENTED PROGRAMMING THROUGH JAVA	CO1:Develop Applications for Range of Problems Using Object-Oriented Programming Techniques
			CO2:Design Simple Graphical User Interface Applications.
34	III-II	MOBILE COMMUNICATIONS AND NETWORKS	CO1:Known the evolution of cellular and mobile communication system.
			CO2:The student will be able to understand Co-Channel and Non-Co-Channel interferences.
			CO3:Understand impairments due to multipath fading channel and how to overcome the different
			CO4:. Familiar with cell coverage for signal and traffic, diversity, techniques, frequency management,
			CO5: Know the difference between cellular and Adhoc Networks and design goals of MAC Layer
35	III-II	EMBEDDED SYSTEM DESIGN	CO1:To understand the selection procedure of Processors in the embedded domain
			CO2:Design Procedure for Embedded Firmware.
			CO3:To visualize the role of Real time Operating Systems in Embedded Systems.
			CO4:To evaluate the Correlation between task synchronization and latency issues


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36	III-II	DIGITAL SIGNAL PROCESSING LAB	CO1:Apply discrete Fourier transforms for spectral analysis of discrete signals.
			CO2:Apply fast Fourier transform algorithms for reducing computational complexity of
			CO3:Compare IIR digital filter and FIR Digital filters using different methods.
			CO4:Analyze the Goertzel algorithm for the generation and detection of dual-tone multi-frequency
			CO5:Apply multi-rate signal processing methods such as decimation and interpolation
			CO6: Apply the digital signal processing algorithms for designing real time embedded
37	III-II	e-CAD LAB	CO1:Design entry and simulation of combinational & sequential circuits and
			CO2:Synthesis, p&r and post p&r simulation for combinational and
			CO3:Implementation of the combinational & sequential circuits on FPGA
			CO4:Write verilog and VHDL code for different circuits and understanding
38	III-II	SCRIPTING LANGUAGES LAB	CO1:Ability to understand the differences between Scripting languages and programming languages
			CO2:Able to gain some fluency programming in Ruby, Perl, TCL
39	III-II	ENVIRONMENTAL SCIENCE	CO1:Understanding the importance of ecological balance for sustainable development
			CO2:Understanding the impacts of developmental activities and mitigation measures
			CO3:Understanding the environmental policies and regulations
40	IV-I	MICROWAVE AND OPTICAL COMMUNICATIONS	CO1:Known power generation at microwave frequencies and derive the performance characteristics
			CO2:realize the need for solid state microwave sources and understand the principles of solid state
			CO3:distinguish between the different types of waveguide and ferrite components, and select proper
			CO4:understand the utility of S-parameters in microwave component design and learn the
			CO5:Understand the mechanism of light propagation through Optical Fibres.
41	IV-I	ARTIFICIAL NEURAL NETWORKS (PE-III)	CO1:Understand the similarity of Biological networks and Neural networks
			CO2:Perform the training of neural networks using various learning rules.
			CO3:Understanding the concepts of forward and backward propagations.
			CO4:Understand and Construct the Hopfield models.


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42	IV-I	SCRIPTING LANGUAGES (PE-III)	CO1:Known about basics of Linux and Linux Networking
			CO2:Use Linux environment and write programs for automation
			CO3:Understand the concepts of Scripting languages
			CO4:Create and run scripts using PERL/TCI/Python.
43	IV-I	DIGITAL IMAGE PROCESSING (PE-III)	CO1:Explore the fundamental relations between pixels and utility of 2-D transforms in image
			CO2:Understand the enhancement, segmentation and restoration processes on an image.
			CO3:Implement the various Morphological operations on an image
			CO4:Understand the need of compression and evaluation of basic compression algorithms.
44	IV-I	BIOMEDICAL INSTRUMENTATION (PE-IV)	CO1:Understand biosystems and medical systems from an engineering perspective
			CO2: Identify the techniques to acquire record and primarily understand physiological activity of the
			CO3:Understand the working of various medical instruments and critical care equipment
			CO4: Know the imaging techniques including CT,PET, SPECT and MRI used in diagnosis of various
45	IV-I	DATABASE MANAGEMENT SYSTEMS (PE-IV)	CO1:Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO2: Master the basics of SQL for retrieval and management of data
			CO3:Be acquainted with the basics of transaction processing and concurrency control.
			CO4: Familiarity with database storage structures and access techniques
46	IV-I	NETWORK SECURITY AND CRYPTOGRAPHY (PE-IV)	CO1:Describe network security fundamental concepts and principles
			CO2: Master the basics of SQL for retrieval and management of data
			CO3:Analyze key agreement algorithms to identify their weaknesses
			CO4:Identify and assess different types of threats, malware, spyware, viruses, vulnerabilities
47	IV-I	PROFESSIONAL PRACTISE , LAW AND ETHICS	CO1:The students will understand the importance of professional practice, Law and
			CO2: Master the basics of SQL for retrieval and management of data


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48	IV-I	MICROWAVE AND OPTICAL COMMUNICATIONS LAB	CO1:Known power generation at microwave frequencies and derive the performance characteristics.
			CO2: realize the need for solid state microwave sources and understand the principles of solid state
			CO3:distinguish between the different types of waveguide and ferrite components, and select proper
			CO4: understand the utility of S-parameters in microwave component design and learn the
			CO5:Understand the mechanism of light propagation through Optical Fibres.
49	IV-II	SATELLITE COMMUNICATIONS (PE-V)	CO1:Understand basic concepts and frequency allocations for satellite communication, orbital
			CO2: Envision the satellite sub systems and design satellite links for specified C/N.
			CO3:Understand the various multiple access techniques for satellite communication systems and
			CO4: Known the concepts of LEO, GEO Stationary Satellite Systems and satellite navigation
50	IV-II	RADAR SYSTEMS(PE-V)	CO1:Derive the complete radar range equation
			CO2:Understand the need and functioning of CW, FM-CW and MTI radars
			CO3:Known various Tracking methods.
			CO4: Derive the matched filter response characteristics for radar receivers.
51	IV-II	WIRELESS SENSOR NETWORKS(PE-V)	CO1:Analyze and compare various architectures of Wireless Sensor Networks
			CO2:Understand Design issues and challenges in wireless sensor networks
			CO3:Analyze and compare various data gathering and data dissemination methods.
			CO4: Design, Simulate and Compare the performance of various routing and MAC protocol
52	IV-II	SYSTEM ON CHIP ARCHITECTURE (PE-V)	CO1:Expected to understand SOC Architectural features
			CO2:To acquire the knowledge on processor selection criteria and limitations
			CO3:To acquires the knowledge of memory architectures on SOC.
			CO4: To understands the interconnection strategies and their customization on SOC
53	IV-II	TEST AND TESTABILITY (PE-VI)	CO1:To acquire the knowledge of fundamental concepts in fault and fault diagnosis
			CO2:Test pattern generation using LFSR and CA
			CO3: Design for testability rules and techniques for combinational circuits
			CO4: Introducing scan architectures

54	IV-II	LOW POWER VLSI DESIGN (PE-VI)	CO1:Understand the need of Low power circuit design.
			CO2:Attain the knowledge of architectural approaches.
			CO3:Analyze and design Low-Voltage Low-Power combinational circuits.
			CO4: Known the design of Low-Voltage Low-Power Memories



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