



**Annamacharya Institute of Technology and Sciences, Tirupati**  
**Department of Electronics and Communication Engineering**  
**Course Outcomes(COs)**  
**AK-20 Regulations**



Course Title	Course Outcomes(COs)	
Algebra and Calculus	CO1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications.
	CO2	Utilize mean value theorems to real life problems.
	CO3	Familiarize with functions of several variables which is useful in optimization.
	CO4	Students will also learn important tools of calculus in higher dimensions. Students will become familiar with 2- dimensional coordinate systems.
	CO5	Students will become familiar with 3- dimensional coordinate systems and also learn the utilization of special functions
Applied Physics	CO1	Analyze the wave properties of light and the interaction of energy with the matter.
	CO2	Apply electromagnetic wave propagation in different guided media.
	CO3	Asses the electromagnetic wave propagation and its power in different media.
	CO4	Analyze the conductivity of semiconductors.
	CO5	Interpret the difference between normal conductor and superconductor and apply the nanomaterials for engineering applications.
Communicative English	CO1	Identify the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English.
	CO2	Formulate sentences using proper grammatical structures and correct word forms.
	CO3	Speak clearly on a specific topic using suitable discourse markers in informal discussions.
	CO4	Write summaries based on global comprehension of reading/listening texts
	CO5	Produce a coherent paragraph interpreting a figure/graph/chart/table
	CO6	Take notes while listening to a talk/lecture to answer questions

Engineering Workshop Practice	CO1	Apply wood working skills in real world applications.
	CO2	Build different parts with metal sheets in real world applications.
	CO3	Apply fitting operations in various applications.
	CO4	Apply different types of basic electric circuit connections.
	CO5	Demonstrate soldering and brazing.
Problem Solving and Programming	CO1	Construct his own computer using parts.
	CO2	Recognize the importance of programming language independent constructs
	CO3	Solve computational problems
	CO4	Select the features of C language appropriate for solving a problem
	CO5	Design computer programs for real world problems
	CO6	Organize the data which is more appropriated for solving a problem
Communicative English Lab	CO1	Remember and understand the different aspects of the English language proficiency with emphasis on LSRW skills
	CO2	Apply communication skills through various language learning activities
	CO3	Analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension.
	CO4	Evaluate and exhibit acceptable etiquette essential in social and professional settings.
	CO5	Create awareness on mother tongue influence and neutralize it in order to improve fluency in spoken English.
Applied Physics Lab	CO1	Analyze the wave properties of light and the interaction of energy with the matter.
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Problem Solving and Programming Lab	CO1	Construct a Computer given its parts (L6)
	CO2	Select the right control structure for solving the problem (L6)
	CO3	Analyze different sorting algorithms (L4)
	CO4	Design solutions for computational problems (L6)

	CO5	Develop C programs which utilize the memory efficiently using programming constructs like pointers.
Differential Equations and Vector Calculus	CO1	Apply the mathematical concepts of ordinary differential equations of higher order.
	CO2	Solve the differential equations related to various engineering fields.
	CO3	Identify solution methods for partial differential equations that model physical processes.
	CO4	Interpret the physical meaning of different operators such as gradient, curl and divergence.
	CO5	Estimate the work done against a field, circulation and flux using vector calculus.
Chemistry	CO1	Understand the behavior of, and interactions between matter and energy at both the atomic and molecular levels
	CO2	Compare the materials of construction for battery and electrochemical sensors
	CO3	Understand the preparation, properties, and applications of thermoplastics & thermo settings, elastomers & conducting polymers.
	CO4	HPLC and GC methods used for separation of gaseous and liquid mixtures.
	CO5	Understand the disadvantages of using hard water and select suitable treatments domestically and industrially.
Network Theory	CO1	Solve network problems using mesh and nodal analysis techniques
	CO2	Analyze networks using Thevenin, Norton, Maximum power transfer, Superposition, Miller and Millman theorems
	CO3	Compute responses of first order and second order networks using time & frequency domain analysis
	CO4	Design resonant circuits for given bandwidth
	CO5	Utilize z, y, ABCD and h parameters for analyzing two port circuit behavior
Data Structures	CO1	Select Appropriate Data Structure for solving a real world problem
	CO2	Select appropriate file organization technique depending on the processing to be done
	CO3	Construct Indexes for Databases
	CO4	Analyze the Algorithms
	CO5	Develop Algorithm for Sorting large files of data
Engineering Graphics	CO1	Draw various curves applied in engineering.

	CO2	Show projections of solids and sections graphically.
	CO3	Draw the development of surfaces of solids.
	CO4	Use computers as a drafting tool.
	CO5	Draw isometric and orthographic.
Network Theory Lab	CO1	Verify Kirchoff's laws and network theorems
	CO2	Measure time constants of RL & RC circuits
	CO3	Analyze behavior of RLC circuit for different cases
	CO4	Design resonant circuit for given specifications
	CO5	Characterize and model the network in terms of all network parameters
Chemistry Lab	CO1	To familiarize the students with the basic concepts of chemistry of materials
	CO2	Prepare advanced polymer materials
	CO3	Measure the strength of an acid present in secondary batteries
	CO4	To familiarize with digital and instrumental methods of analysis
Data Structures Lab	CO1	Select the data structure appropriate for solving the problem
	CO2	Implement searching and sorting algorithms
	CO3	Design new data types
	CO4	Illustrate the working of stack and queue
	CO5	Organize the data in the form of files
Constitution of India	CO1	Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
	CO2	Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
	CO3	Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.

	CO4	Discuss the Powers and functions of Governor, President, and Judiciary.
	CO5	Discuss the functions of local administration bodies.
Electronic Devices & Circuits	CO1	Understand the operation of diodes and special electronic devices.
	CO2	Know operation of different rectifiers without and filters.
	CO3	Understand construction, operation of BJT, FET in different configurations
	CO4	Know the need of biasing and design of DC biasing circuits.
	CO5	Design of amplifiers with BJTs and FETs by using small signal model
Switching Theory And Logic Design	CO1	To introduce basic postulates of Boolean algebra.
	CO2	To introduce basic methods for simplifying Boolean expressions.
	CO3	To illustrate the concepts and study the procedures for the analysis and design of combinational circuits.
	CO4	To illustrate the concepts and study the procedures for the analysis and design of sequential circuits.
	CO5	To introduce the concepts of programmable logic devices.
Signals & Systems	CO1	Understand mathematical description and representation of continuous time and discrete time signals.
	CO2	Resolve signals in frequency domain using Fourier Series and Fourier Transforms
	CO3	Apply sampling theorem to convert continuous-time signals to discrete-time signal
	CO4	Understand the properties of systems, response of LTI systems and filters.
	CO5	Able to analyze CT LTI systems and DTLTI systems using Laplace and Z-Transforms
Transform Techniques And Complex Variables	CO1	Find the differentiation and integration of complex functions used in engineering problems.
	CO2	Apply the Laplace transform for solving differential equations (continuous systems).

	CO3	Find the Fourier series of periodic signals.
	CO4	Know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms.
	CO5	Develop Z transform techniques for discrete time systems.
Managerial Economics and Financial Analysis	CO1	Understand the fundamentals of Economics and Managerial economics viz., Demand, Production, cost, revenue and markets.
	CO2	Apply the Concept of Production cost and revenues for effective Business decision
	CO3	Analyze how to invest their capital and maximize returns.
	CO4	Evaluate the capital budgeting techniques.
	CO5	Define the concepts related to financial accounting and management and able to develop the accounting Statements and evaluate the financial performance of business entity.
Electronic Devices & Circuits Lab	CO1	Test and operate diodes and special electronic devices.
	CO2	Construct and operate rectifiers without and with filters.
	CO3	Construct and operate BJT, FET in different configurations.
	CO4	Design DC biasing circuits for Transistors.
	CO5	Design amplifiers using BJTs and FETs.
Signals & Systems Lab	CO1	Understand basics of MATLAB syntax, functions and programming.
	CO2	Generate and characterize various signals and perform the basic operations
	CO3	Design and analyze linear time-invariant (LTI) systems and compute its response
	CO4	Analyze the spectral characteristics of signals using Fourier analysis.
	CO5	Analyze the systems using Laplace transforms and Z-transforms.
Switching Theory And Logic Design Lab	CO1	Ability to verify all logic gates.
	CO2	Ability to Design combinational circuits.

	CO3	Ability to design flip flops.
	CO4	Ability to design counters.
	CO5	Ability to design sequence generator.
Electronic Circuit Design	CO1	Identify basic Electronic Components
	CO2	Understand Fundamentals of Circuit Design.
	CO3	Construct different Power Supply circuits.
	CO4	Analyze Printed Circuit Boards.
	CO5	Design a Electronic circuit as a mini project.
Biology For Engineers	CO1	Explain about cells and their structure and function. Different types of cells and basics for classification of Living Organisms.
	CO2	Explain about biomolecules, their structure, function and their role in the living organisms. How biomolecules are useful in Industry.
	CO3	Brief about human physiology.
	CO4	Explain about genetic material, DNA, genes and RNA how they replicate, pass and preserve vital information in Living Organisms.
	CO5	Know about application of biological principles in different technologies for the production of medicines and Pharmaceutical molecules through transgenic microbes, plants and animals.
Basics Of Python Programming	CO1	To learn the fundamentals of Python.
	CO2	To elucidate problem-solving using a Python programming language.
	CO3	To introduce a function-oriented programming paradigm through python.
	CO4	To get training in the development of solutions using modular concepts.

	CO5	To introduce the programming constructs of python.
Probability Theory And Stochastic Processes	CO1	Understand the concepts of probability and random variables.
	CO2	Understand the concepts of Multiple Random Variables and operations that may be performed on Multiple Random variables.
	CO3	Understand the concepts of Random Process and its Temporal Characteristics.
	CO4	Understand the concepts of Random Process and its Spectral Characteristics.
	CO5	Understand the Spectral characteristics of response of an LTI system
Electromagnetic Theory & Transmission Lines	CO1	Understand basic laws of electric fields and Solve problems related to electric fields.
	CO2	Apply laws of magnetic fields and Solve problems related to magnetic fields.
	CO3	Analyze electric and magnetic fields at the interface of different media and derive Maxwell's equations for static and time varying fields.
	CO4	Proficient with analytical skills for understanding propagation of electromagnetic waves in different media.
	CO5	Understand the concept of transmission lines & their applications.
Analog Communication Systems	CO1	Acquire knowledge on the basic concepts of Analog Communication Systems.
	CO2	Analyze the analog modulated and demodulated systems.
	CO3	Analyze the performance of the communication system in presence of noise
	CO4	Know the working of various transmitters and receivers
	CO5	Know the fundamental concepts of information and capacity.
Electronic Circuit Analysis	CO1	Understand multi stage amplifiers using BJT and FET.
	CO2	Understand high frequency model and analyze its frequency responses.



	CO3	Understand feedback amplifiers and oscillators along with design.
	CO4	Understand power amplifiers.
	CO5	Understand tuned amplifiers and their effect on bandwidth and stability.
Basics Of Python Programming Lab	CO1	Design solutions to mathematical problems.
	CO2	Organize the data for solving the problem.
	CO3	Develop Python programs for numerical and text based problems.
	CO4	Select appropriate programming construct for solving the problem.
	CO5	Illustrate object oriented concepts.
Analog Communication Systems Lab	CO1	Design modulation and demodulation circuits such as AM, PM, FM.
	CO2	Design the PAM, PWM&PPM circuits
	CO3	Identify and understand different types of antennas, radiation pattern
	CO4	Identify and measure Radio receiver measurements the parameters
	CO5	Construct pre-emphasis and de-emphasis at the transmitter and receiver respectively
Electronic Circuit Analysis Lab	CO1	The ability to analyze and design single and multistage amplifiers at low, mid and high frequencies.
	CO2	Designing and analyzing the transistor at high frequencies.
	CO3	Determine the efficiencies of power amplifiers.
	CO4	Determine Frequency response and design of tuned amplifiers.
	CO5	Able to Analyze all the circuits using simulation software and Hardware.
Internet Of Things	CO1	Describe characteristics and functionality of IoT
	CO2	Understand the types of Sensors.

	CO3	Compute the different enabling technologies for Arduino IDE.
	CO4	Assemble different electronic components in Development Boards.
	CO5	Design an IOT application as a mini project..
Universal Human Values	CO1	Students are expected to become more aware of themselves, and their surroundings (family, society, nature).
	CO2	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
	CO3	They would have better critical ability.
	CO4	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
	CO5	It is hoped that they would be able to 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 in this direction.