

**G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY**  
**(Autonomous)**

(Approved by AICTE | NAAC Accreditation with 'A' Grade |  
Accredited by NBA (CIV, CSE, ECE & EEE) | Affiliated to JNTUA)  
Nandikotkur Road, Venkayapalli (V), Kurnool - 518452, Andhra Pradesh

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**R 18 REGULATIONS**

Course Name: **FUNCTIONAL ENGLISH**

	Course Outcomes
CO1	Understand and remember various aspects of English.
CO2	Analyze the different situations of speaking and writing skills.
CO3	Apply the LSRW skills to the societal communication.
CO4	Analyze the importance of English in Science and Technological context.
CO5	Able to demonstrate the acquired knowledge in executing the technical writing.
CO6	Apply the significance of team work in problem solving technique .

Course Name: **ENGLISH LANGUAGE COMMUNICATION SKILLS LAB**

	Course Outcomes
CO1	Remember and understand better pronunciation.
CO2	Analyze the fluency and neutralize mother tongue influence.
CO3	Acquire proficiency and become active participant in communication like GDs, Debates.
CO4	Understand the difference among different accents.
CO5	Write effectively in different formats like letters, e-mails.
CO6	Enhancing the minimum employability.

Course Name: **MATHEMATICS-I**

	Course Outcomes
CO1	Apply the mathematical principles to solve first and second order differential equations
CO2	Analyze the non homogeneous linear differential equations of second and higher order along with Euler – Cauchy’s equations and Legendre’s linear equation
CO3	Apply the differential equations of second and higher order in various streams ---like Electrical Circuits, Simple Harmonic motion, Deflection of beams
CO4	Estimate the Taylors and Maclaurin series involving Maxima and minima of functions consisting of 2 variables along with radius of curvature
CO5	Evaluate the multiple integrals involving double and triple integrals along with change of order of integration and apply the multiple integrals to areas and volumes in polar and Cartesian coordinates.
CO6	Analyze the concept of vector calculus involving divergence, curl, green’s theorem, and Stokes and Gauss theorems.

Course Name: **COMPUTER PROGRAMMING**

	Course Outcomes
CO1	Comprehend the fundamental concepts of computer hardware and problem solving abilities
CO2	Knowledge on the basic concepts of algorithms, flow charts and C programming
CO3	Ability to analyze the procedure for providing input and acquire output from the program along with implementation of control statements
CO4	Interpret the importance of pointers and functions in programming
CO5	Analyze and Modularize the problem and its solution by using functions, structures and unions
CO6	Ability to relate the concepts of strings, files and preprocessors to the real world applications

Course Name: **COMPUTER PROGRAMMING LAB**

	Course Outcomes
CO1	Utilize problem solving techniques to find solutions to problems.
CO2	Able to use C language features effectively and implement solutions using C language.
CO3	Explore to identify the appropriate data structure for a given problem or application.
CO4	Improve logical and technical skills.
CO5	Apply programming skills to solve complex C problems.
CO6	Apply various analytical skills to implement solutions using C language.

Course Name: ENGINEERING CHEMISTRY

	Course Outcomes
CO1	Analyze the various procedures involved in the treatment of water from the industrial water and treatment of boiler feed water.
CO2	Understand/Apply the various preparations of polymers along with conducting polymers and inorganic polymers.
CO3	Illustrate a detailed review on the working of electrochemical cells, and the process of corrosion preventions.
CO4	Analyze the classification of fuels along with their characteristics and calorific value involving solid fuels.
CO5	Interpret various liquid and gaseous fuels along with their process of origin, properties, advantages and disadvantages
CO6	Summarize the underlying chemistry of engineering materials involving refractories, lubricants ,rocket propellants and carbon clusters

Course Name: ENGINEERING CHEMISTRY LAB

	Course Outcomes
CO1	Analyze the volumetric analysis of hardness of water, copper by EDTA method and Winkler's method.
CO2	Analyze the ferrous ion using diphenylamine dichrometrically and acidity, alkalinity of water.
CO3	Understand and perform the preparation of phenol formaldehyde resin.
CO4	Demonstrate and calculate the viscosity of oil through viscometer - I
CO5	Demonstrate and calculate the viscosity of oil through viscometer - II
CO6	Interpret the conductance of acid base samples conductometrically.

Course Name: ENVIRONMENTAL STUDIES

	Course Outcomes
CO1	Remember the definition and need for environmental studies involving public awareness and natural resources.
CO2	Understand various eco systems involving forest, grassland, desert and aquatic type, their biodiversity and scientific methods to protect them
CO3	Analyze the various types of pollution in the environment relating to air, water, soil and their corresponding methods of control
CO4	Understand the various causes, effects and control measures of urban and industrial wastes along with disaster management
CO5	Discuss the various social issues related to environment and bring about public awareness regarding the pollution
CO6	Justify an insight into the human population along with women and child care and perform various case studies on role of information technology in environment

Course Name: **ENGLISH FOR PROFESSIONAL COMMUNICATION**

	Course Outcomes
CO1	Ability to understand and remember various aspects of English.
CO2	Critically analyze the wide range of techniques involved in speaking and writing skills.
CO3	Apply the LSRW skills for the professional communication.
CO4	Analyze the significance of English in Science and Technological context.
CO5	Able to demonstrate the acquired knowledge in executing the technical writing skills.
CO6	Apply the significance of team work in problem solving methods .

Course Name: **MATHEMATICS-II**

	Course Outcomes
CO1	Analyze the concept of Laplace transform of standard functions along with inverse transform, dirac's delta function and convolution theorem
CO2	Apply the Laplace transforms to ordinary differential equations of first order and second order
CO3	Carry out the determination of Fourier coefficients in terms of Fourier series involving Half range Fourier sine and cosine expansions
CO4	Interpret the Fourier integral theorem along with Fourier sine and cosine transformation and also the concept of inverse transformation
CO5	Formulate the partial differential equations through elimination of arbitrary constants and also understand the technique of separation of variables
CO6	Analyze the technique of Z-transformation for various conditions along with analysis of Fourier transforms

Course Name: **ENGINEERING PHYSICS LAB**

	Course Outcomes
CO1	<b>Understand</b> the concept of interference by finding thickness of paper and radius of curvature of plano-convex lens by forming Parallel fringes and Newton's rings.
CO2	<b>Interpret</b> the concept of diffraction by finding the wavelength of different colours of white light and LASER.
CO3	<b>Examine</b> the behavior of the ferromagnetic material by plotting B-H curve and verifies Biot-Savart's law by using Stewart-Gee's apparatus.
CO4	<b>Analyze</b> the propagation of a wave in a medium by determining the dispersive power of prism, acceptance angle, and numerical aperture of an optical fiber.
CO5	<b>Interpret</b> the nature of a semiconductor by determining its energy gap.
CO6	<b>Demonstrate</b> the concept of diffraction due to single slit by finding the width of the slit.

Course Name: **NETWORK ANALYSIS**

	Course Outcomes
CO1	Analyze the concept of electrical circuits and magnetic circuits and study different techniques to calculate voltage and current and also Interpret the technique of solving circuits employing various theorems
CO2	Perform the D.C and A.C transient analysis on combination of circuits along with source transformation
CO3	understand and analyze the fundamental concept of single phase circuits and also determine different powers for a given circuit
CO4	Depict the locus diagrams of various combinations of circuits along with the analysis of concept of resonance
CO5	understand and analyze the concept of two port parameters and apply it for different two port networks
CO6	Understand the concept of filters and able to design different filters

Course Name: **NETWORK ANALYSIS LAB**

	Course Outcomes
CO1	Solve the electrical network using mesh and nodal analysis by applying network theorems
CO2	Estimate the impedance for maximum power transfer and will be in a position to design the systems for maximum power transformation.
CO3	Analyze the transient response of series and parallel A.C. circuits and to solve problems in time domain using Laplace Transform.
CO4	Communicate clearly and use the appropriate medium, including written, oral, and electronic methods.
CO5	Analyze and design a filter to meet its specifications using PSPICE Software
CO6	Engage in independent and lifelong learning in the context of technological changes.

Course Name: **Engineering Drawing**

	Course Outcomes
	At the end of the course, the student will be able to
CO1	Drawing 2D and 3D diagrams of various object
CO2	Learning conventions of Drawing, which is an Universal Language of Engineers
CO3	Drafting projections of points, planes and solids
CO4	Construct various curves like ellipse, parabola, hyperbola etc which are used in Engineering drawing.
CO5	Apply orthographic projection concepts to draw projections of points, lines, planes and solids
CO6	Apply development concepts to draw development of surfaces of simple solids

Course Name: **ENGINEERING & I.T. WORKSHOP**

Course Outcomes	
At the end of the course, the student will be able to	
CO1	To provide Technical training to the students on Productivity tools like Word processors, Spreadsheets, Presentations
CO2	To make the students know about the internal parts of a computer, assembling a computer from the parts, preparing a computer for use by installing the operating system
CO3	To learn about Networking of computers and use Internet facility for Browsing and Searching.
CO4	Apply wood working skills in real world applications. Build different parts with metal sheets in real world applications
CO5	Apply fitting operations in various applications
CO6	Apply different types of basic electric circuit connections

Course Name: **Electrical circuits -I**

Course Outcomes	
CO1	Analyze the concept of electrical circuits and magnetic circuits and study different techniques to calculate voltage and current.
CO2	Determining the response of circuits to single phase A.C excitation and evaluate the RMS value and Average Values
CO3	Depict the locus diagrams of various combinations of circuits along with the analysis of concept of resonance
CO4	Understand the concept of bandwidth and Q factor in various series and parallel circuits.
CO5	Interpret the technique of solving circuits employing theorems which involve Norton's, Thevenin's, Maximum Power transfer theorem etc.
CO6	Analyze the concept of two port parameters with respect to impedance, admittance, Transmission and Hybrid parameters



Course Name: **Electrical circuits Lab**

	Course Outcomes
CO1	Perform the verification of theorems like Norton's Theorem, Thevenin's theorem, super position theorem, maximum power transfer theorem experimentally and theoretically.
CO2	Evaluate the frequency at which series and parallel resonance occurs in a given circuit
CO3	Calculate the impedance and admittance parameters along with transmission parameter and hybrid parameters for a given circuit.
CO4	Measure the active and reactive power for star and delta connected balanced loads
CO5	Assess the value of 3 phase power for unbalanced loads employing two wattmeter method
CO6	Determine the self inductance, mutual inductance and coefficient of coupling of coupled circuits

Course Name: **MATERIALSCIENCEANDENGINEERING**

	Course Outcomes
CO1	Students will get knowledge on bonds of solids and knowing the crystallization of metals. By knowing the grain size and shape through the crystallization
CO2	Students will be able to construct the equilibrium diagrams by experimental methods and knowing all types of equilibrium diagrams
CO3	Students will be able to learn the structure and properties of all cast irons, steels and Non-ferrous metal alloys of copper, Al and Titanium.
CO4	Students will be able to learn the methods of different heat treatments i.e. annealing, normalizing and hardening.
CO5	This unit helps the students to understand the importance of advanced composite materials in application to sophisticated machine and structure of components

Course Name: **MATERIALSCIENCEANDENGINEERING LAB**

	Course Outcomes
CO1	Make use of different material samples for investigating micro structures.
CO2	Interpret the microstructures of materials using metallurgical microscope
CO3	Measure the harden ability of mild steel samples.
CO4	Improve the properties of materials using various heat treatment processes.
CO5	Compare the properties of different materials with temperature variation.

Course Name: **ENGINEERING MECHANICS**

	Course Outcomes
CO1	To analyze the basic concepts of rigid bodies subjected to different types of loads and supports.
CO2	To analyze the motion of the bodies considering friction and external loads.
CO3	To determine Centroids and area moment of inertia and centre of gravity and mass moment of inertia of simple and composite figures.
CO4	To analyse the motion of particle without considering forces and considering forces
CO5	To analyze the perfect frames using method of joints, method of sections & tension coefficient method for vertical , horizontal and inclined loads and concepts of Mechanical vibrations. (Simple, compound and torsional pendulums)
CO6	To analyse the motion of particle with and without considering forces

Course Name: **APPLIED MECHANICS LAB**

Course Outcomes	
	At the end of the course, the student will be able to
CO1	Acquire knowledge of static and dynamic behavior of the bodies.
CO2	Acquire the knowledge, so that they can understand physical phenomenon with the help of various theories.
CO3	Explain the physical phenomenon with help of diagrams.
CO4	with broad vision with the skills of visualizing and developing their own ideas, and to convert those ideas in to engineering problems and solving those problems with the acquired knowledge of the Engineering mechanics
CO5	Apply the principles of mechanics to analyze structural and machine elements.
CO6	Identify the different types of beams and the types of loading. Derive expressions to determine the bending stress, deflection and shear stress in beams subjected to various types loading.

Course Name: **DATA STRUCTURES**

Course Outcomes	
CO1	Familiarize the student with good programming design methods, particularly Top-Down design
CO2	To develop skills to design and analyze linear and non linear data structures.
CO3	Develop algorithms for manipulating linked lists, stacks, queues, trees and graphs.
CO4	Develop recursive algorithms as they apply to trees and graphs.
CO5	To develop a base for advanced computer science study
CO6	Familiarize the student with the issues of Time complexity and examine various algorithms from this perspective

**COURSE NAME: DATA STRUCTURES LAB**

	Course Outcomes
CO1	Learn to choose appropriate data structure as applied to specified problem definition.
CO2	Design and analyze linear and non-linear data structures.
CO3	Design and implement algorithms for manipulating linked lists, stacks, queues, trees and graphs in python
CO4	Implement recursive algorithms as they apply to trees and graphs.
CO5	Formulate new solutions for programming problems or improve existing code using learned algorithms and data structures
CO6	Implement operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.