

# 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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The following are the Course Outcomes of all the courses for the Academic Year 2019-20 for I-B. Tech

### R19 REGULATIONS

Course Name: **MATHEMATICS – I**

	Course Outcomes
CO1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications
CO2	CO2 Interpret the Eigen values and Eigen vectors of matrix in terms of the transformation it represents in to a matrix Eigen value problem
CO3	CO3 Utilize mean value theorems to real life problems.
CO4	CO4 familiarize with functions of several variables which is useful in optimization
CO5	Students will also learn important tools of calculus in higher dimensions. Students will become familiar with 2- dimensional coordinate systems
CO6	Students will become familiar with 3- dimensional coordinate systems and also learn the utilization of special functions

Course Name: **CHEMISTRY**

	Course Outcomes
CO1	To illustrate the molecular orbital energy levels for different molecular species and apply Schrödinger wave equation and particle in a box.
CO2	To differentiate between pH metry Potentio metry and conductometric titrations
CO3	Explain the preparation properties and applications of polymers and describe the mechanism of conduction in conducting polymers.
CO4	Understand the principles of different analytical instruments and explain their
CO5	Explain the concept of nano clusters nano wires and characterize the applications of SEM & TEM.
CO6	Explain of different types of colloids, their preparations, properties and applications

**Course Name: PYTHON 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 python 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
CO6	Ability to relate the concepts of strings, files and preprocessors to the real-world applications

**Course Name: PYTHON PROGRAMMING LAB**

	Course Outcomes
CO1	Design solutions to mathematical problems & organize the data for solving the problem.
CO2	Understand and implement modular approach using python.
CO3	Learn and implement various data structures provided by python library including string, list, dictionary and its operations etc
CO4	Understands about files and its applications.
CO5	Develop real-world applications, files and exception handling provided by python.
CO6	Select appropriate programming construct for solving the problem.

**Course Name: CHEMISTRY LAB**

	Course Outcomes
	At the end of the course, the student will be able to
CO1	Understand the determine the cell constant and conductance of solutions
CO2	Prepare advanced polymer materials.
CO3	Measure the strength of an acid present in secondary batteries
CO4	Understand and apply the pH metric titrations.
CO5	Verify Lambert-Beer's law
CO6	Potentiometry - determination of redox potentials and EMFs

**COURSE NAME: PRINCIPLES OF ELECTRICAL ENGINEERING**

	Course Outcomes
CO1	Apply concepts of KVL/KCL and network theorems in solving DC circuits
CO2	Analyze steady state behavior of single phase and three phase AC electrical circuits
CO3	Choose correct rating and characteristics of a transformer for a specific application
CO4	Illustrate working principles of induction motor, dc motor and synchronous generator.
CO5	Identify type of electrical machine based on their construction.
CO6	Describe working principles of protection devices used in electrical circuits

**COURSE NAME: PRINCIPLES OF ELECTRICAL ENGINEERING LAB**

	Course Outcomes
CO1	Get exposure to common electrical components and their ratings.
CO2	Make electrical connections by wires of appropriate ratings.
CO3	Understand usage of common electrical measuring instruments.
CO4	Determine performance characteristics of transformers and electrical machines.

**Course Name: MATHEMATICS – II**

	Course Outcomes
CO1	Apply the mathematical principles to solve second and higher order differential equations.
CO2	Analyze the non- homogeneous linear differential equations along with method of variation of parameters.
CO3	Apply the concept of higher order differential equations to the various streams like Mass spring system and L-C-R Circuit problems.
CO4	Apply a range of techniques to find solutions of standard PDEs and basic properties of standard PDEs.
CO5	Analyze the vector calculus involving divergence, curl and their properties alongwith vector identities.
CO6	Apply Green's, Stokes and Divergence theorem in evaluation of double and triple integrals.

**Course Name: DATA STRUCTURES**

	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 algorithms for manipulating linked lists, stacks, queues, trees and graphs
CO4	Demonstrate advantages and disadvantages of specific algorithms and data structures
CO5	Develop programs for efficient data organization with reduce time complexity
CO6	Evaluate algorithms and data structures in terms of time and memory complexity of basic operations.

**Course Name: COMMUNICATIVE ENGLISH**

	Course Outcomes
CO1	Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English
CO2	Apply grammatical structures to formulate sentences and correct word forms
CO3	Analyze discourse markers to speak clearly on a specific topic in informal discussions
CO4	Evaluate reading/listening texts and to write summaries based on global comprehension of these texts.
CO5	Create a coherent paragraph interpreting a figure/graph/chart/table
CO6	Understand the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English

**Course Name: ENGINEERING GRAPHICS AND COMPUTER AIDED DRAFTING**

	Course Outcomes
CO1	Learning conventions of Drawing, which is an Universal Language of Engineers. Also Interpret and Sketch the various curves which Including ellipse, parabola, hyperbola
CO2	Analyze and draft the orthographic projections of points and lines
CO3	Analyze and sketch the orthographic projections of planes and solids
CO4	Revise and Improve their visualization skills in the development of new products
CO5	Construct the isometric projection of an object employing orthographic projections
CO6	Drawing 2D and 3D diagrams of various objects

Course Name: **APPLIED PHYSICS**

	Course Outcomes
CO1	Interpret the properties of light waves and its interaction of energy with the matter
CO2	Explain the principles of physics in dielectrics and magnetic materials.
CO3	Apply electromagnetic wave propagation in different guided media.
CO4	Calculate conductivity of semiconductors
CO5	Interpret the difference between normal conductor and super conductor
CO6	Elucidate the applications of nano materials

Course Name: **APPLIED PHYSICS LABORATORY**

	Course Outcomes
CO1	Operate optical instruments like microscope and spectrometer and understand the concepts of interference by finding thickness of paper, radius of curvature of Newton's rings
CO2	interpret the concept of diffraction by the determination of wavelength of different colors of white light and dispersive power of grating
CO3	demonstrate the importance of dielectric material in storage of electric field energy in the capacitors
CO4	plot the intensity of the magnetic field of circular coil carrying current with varying distance and B-H curve
CO5	evaluate the acceptance angle of an optical fiber and numerical aperture
CO6	determine the resistivity of the given semiconductor using four probe method, the band gap of a semiconductor and identify the type of semiconductor using Hall effect

Course Name: **DATA STRUCTURES LAB**

	Course Outcomes
CO1	Learn to choose appropriate data structure as applied to specified problem definition.
CO2	C 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.

**Course Name: COMMUNICATIVE ENGLISH LAB**

	Course Outcomes
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.
CO6	Improve upon speaking skills over telephone, role plays and public speaking.

**COURSE NAME: CO-ENGINEERING LABORATORY**

	Course Outcomes
CO1	To acquire the knowledge about the characteristics and working principles of semiconductor diodes, Bipolar Junction Transistor
CO2	Analysis of Single-Phase AC Circuits, the representation of alternating quantities and determining the power in these circuits
CO3	Able to Measure the amplitude and frequency utilizing oscilloscope and analyze the fabrication processes of printed circuit boards
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

**CourseName:ENGINEERINGPHYSICS**

	CourseOutcomes
CO1	Applymechanicsforsolvingengineeringproblems.
CO2	Applytheprinciplesofacoustics fornoiseancellationandindesigningbuildings
CO3	Analyzetheapplicationsofultasonicsinvariousengineeringfields
CO4	Explaintherelationshipbetweenelasticconstants
CO5	Interprettheconceptsoflasersandopticalfibersinvariousapplications
CO6	Identifythesensorsforvariousengineeringapplications

CourseName:**ENGINEERINGPHYSICS LAB**

	CourseOutcomes
CO1	Estimatethemechanicalpropertiesofmaterials
CO2	Determinemomentofinertiaofaflywheel
CO3	Measurethevelocityofultrasonicsinliquid byapplying thebasicconceptsof ultrasonics
CO4	Determinethewavelengthoflaser,particlesize,numericalapertureandacceptanceanglebyapplyingthe principles oflasers andopticalfibres
CO5	Measurethespringconstants, Poisson'sratioofthematerialandverifyHooke'slaw
CO6	Comparepressureandtemperaturevariationinstraingaugesensorandopticalfibresensor

CourseName:**ENGINEERINGCHEMISTRY**

	CourseOutcomes
CO1	ComparethequalityofdrinkingwaterwithBISandWHOstandards.Illustrateproblemsassociated withhardwateranddemonstrate industrialwatertreatmentprocess.
CO2	DemonstratethecorrosionpreventionmethodandapplyNernstequationforcalculatingelectrodeandcell potentials.
CO3	Analyzetheclassificationoffuelsalongwiththeircharacteristicsandcalorificvalueinvolving solidfuels, liquidandgaseousfuels.
CO4	Explainedifferenttypesofpolymersandtheirapplications,demonstratethemechanismofconductionand conductingpolymers.
CO5	SummarizetheunderlyingchemistryofengineeringmaterialsinvolveCement, lubricants.
CO6	Summarizethe applicationsofSEM,TEMandX-Raydiffractioninsurfacecharacterization.

CourseName:**ENGINEERINGCHEMISTRY LAB**

	CourseOutcomes
CO1	Determinethecellconstantandconductanceofsolutions.
CO2	Prepareadvancedpolymer materials
CO3	Determinethephysicalproperties likesurfacetension, adsorptionandviscosity
CO4	EstimatetheIronand Calciumincement
CO5	Calculatethehardnessofwater and calculationofdissolved oxygenpercentages
CO6	DeterminationofpercentageofIroninCementsample bycolorimetry

**CourseName:ENGINEERINGMECHANICS**

	CourseOutcomes
CO1	Toanalyzethebasicconceptsofrigidbodiessubjectedtodifferenttypesofloadsandsupports.
CO2	Toanalyzethemotionofthebodiesconsideringfrictionandexternalloads.
CO3	TodetermineCentroidsandareamomentofinertiaandcentreofgravityandmassmomentofinertiaofsimple andcompositefigures.
CO4	Toanalysethemotionofparticlewithoutconsideringforcesandconsideringforces
CO5	Toanalyzetheperfectframesusingmethodofjoints,methodofsections&tensioncoefficientmethodforvertical,horizontalandinclinedloads andconceptsofMechanicalvibrations.(Simple,compoundandtorsionalpendulums)
CO6	Toanalysethemotionofparticlewithandwithoutconsideringforces

**CourseName:APPLIED MECHANICS LAB**

	CourseOutcomes
CO1	Acquireknowledgeofstaticanddynamicbehaviorofthebodies.
CO2	Acquiretheknowledge,sothattheycanunderstandphysicalphenomenonwiththehelpofvarioustheories.
CO3	Explainthephysicalphenomenonwithhelpofdiagrams.
CO4	with broad vision with the skills of visualizing and developing their own ideas, and to convertthoseideasintoengineeringproblemsandsolvingthoseproblemswiththeacquiredknowledg eoftheEngineeringmechanics.
CO5	Applytheprinciplesofmechanicstoanalyzestructuralandmachineelements.
CO6	Identify the different types of beams and the types of loading. Derive expressions todeterminethebendingstress,deflectionandshearstressinbeamssubjectedtovarioustypesloadi ng.

**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-I 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: PROBABILITY & STATISTICS**

	Course Outcomes
CO1	Make use of the concepts of probability and their applications
CO2	Apply discrete and continuous probability distributions
CO3	Classify the concepts of data science and its importance
CO4	Interpret the association of characteristics and through correlation and regression tools
CO5	Design the components of a classical hypothesis test
CO6	Infer the statistical inferential methods based on small and large sampling tests

**Course Name: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

	Course Outcomes
CO1	State the basic laws and usage of components in electric circuits.
CO2	Investigate DC and AC circuits using different methods and laws.
CO3	Analyze the principle of operation of DC machines and AC machines along with the various tests to predetermine the efficiency and regulation.
CO4	Understand the theory, operation and applications of semiconductor devices.
CO5	Determine various parameters of rectifier circuits using with and without filters
CO6	Analyze and Design different oscillator circuits, op-amps and the characteristics of BJT, FET to meet the given specifications.

**COURSE NAME: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB**

	Course Outcomes
CO1	Practically verify Superposition ,Thevenin's theorems and Open and Short circuit parameters.
CO2	Predetermine the Efficiency of a given DC Shunt Machine (i) while working as a Motor and (ii) while working as a Generator by using Swinburne's test.
CO3	Predetermine the Efficiency and Regulation at any given load and Power Factor of a transformer by using OC & SC tests.
CO4	Analyze the V-I characteristics of P -N Junction Diode and Zener Diode.
CO5	Analyze the input and output characteristics of BJT, Common Source Configuration Output and Transfer Characteristics of JFET.
CO6	Determination of efficiency of a Half-Wave Rectifier and Full-Wave Rectifier with and without filters.