



# ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

Piglipur, Batasingaram Panchayath, Hayath Nagar Mandal, Hyderabad, R.R. Dist. 501 512.

(Approved by AICTE, Recognized by the GOVT. of T.S., Permanent Affiliation from JNTUH, Hyderabad.)

Accredited by "NAAC" with "A" Grade, Recognized by UGC Under Section 2(f) and 12(B).


Phone : 08415-201689 (O)  
Mobile : 9848924705

Website : aits-hyd.org  
E-mail : principal@aits-hyd.org  
Fax : 08415-201688

2.6.1 Programme and course outcomes for all Programmes offered by the institution are stated and displayed on website and communicated to teachers and students

## COs for all Programmes

S. No.	Content	Page No.
1.	B. Tech-Electrical & Electronics Engineering: II, III & IV years (JNTUH: R18)	1-6
2	B. Tech-Civil Engineering: II, III & IV years (JNTUH: R18)	7-29
3	B. Tech- Electronics and communication Engineering: II, III & IV years (JNTUH: R18)	30-44
4	PG-Master of business applications(MBA) : I&II years (JNTUH: R18)	45-49
5	B. Tech-Humanities and sciences: I - years (JNTUH: R18)	50-58
6	B. Tech-Computer Science Engineering: II, III & IV years (JNTUH: R18)	59-112
7	B. Tech-Mechanical Engineering: II, III & IV years (JNTUH: R18)	113-116

  
PRINCIPAL  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Piglipur (V), Batasingaram (Post),  
Abdullapuram RR, R.R. Dist. HYD-501 512

**1. B. Tech-Electrical & Electronics Engineering: II,III year**

**JNTUH-R18 Regulation**

Code	Course Name	Course Outcomes
<b>II B. TechI Semester</b>		
EE301ES	Engineering Mechanics	<b>At the end of this course, each student should be able to:</b> CO1.Determine resultant of forces acting on a body and analyze equilibrium of a body subjected to a system of forces. CO2.Solve problem of bodies subjected to friction. CO3.Find the location of centroid and calculate moment of inertia of a given section. CO4.Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion. CO5.Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration.
EE302PC	Electrical Circuit Analysis	<b>At the end of this course, each student should be able to:</b> CO6.Apply network theorems for the analysis of electrical circuits. CO7.Obtain the transient and steady-state response of electrical circuits. CO8.Analyze circuits in the sinusoidal steady-state (single-phase and three-phase). CO9.Analyze two port circuit behavior.
EE304PC	Electrical Machines - I	<b>At the end of this course, each student should be able to:</b> CO10.Identify different parts of a DC machine & understand its operation CO11.Carry out different testing methods to predetermine the efficiency of DC machines CO12.Understand different excitation and starting methods of DC machines CO13.Control the voltage and speed of a DC machines CO14.Analyze single phase and three phase transformers circuits.

EE305PC	Electromagnetic Fields	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO15.To understand the basic laws of electromagnetism.</p> <p>CO16.To obtain the electric and magnetic fields for simple configurations under static conditions.</p> <p>CO17.To analyze time varying electric and magnetic fields.</p> <p>CO18.To understand Maxwell’s equation in different forms and different media.</p> <p>CO19.To understand the propagation of EM waves</p>
EE306PC	Electrical Machines Lab - 1	<p><b>At the end of this course, each student should be able to</b></p> <p>CO20.Start and control the Different DC Machines.</p> <p>CO21.Assess the performance of different machines using different testing methods</p> <p>CO22.Identify different conditions required to be satisfied for self -excitation of DC Generators.</p> <p>CO23.Separate iron losses of DC machines into different component</p>
EE308PC	Electrical Circuits Lab	<p><b>At the end of this course, each student should be able to</b></p> <p>CO24.Analyze complex DC and AC linear circuits</p> <p>CO25.Apply concepts of electrical circuits across engineering</p> <p>CO26.Evaluate response in a given network by using theorems</p>

Code	Course Name	Course Outcomes
<b>II B. Tech II Semester</b>		
EE402PC	Electrical Machines – II	<p><b>At the end of this course, students will demonstrate the ability to</b></p> <p>CO1.Understand the concepts of rotating magnetic fields.  CO2.Understand the operation of ac machines.  CO3.Analyze performance characteristics of ac machines.</p>
EE404PC	Control Systems	<p><b>At the end of this course, students will demonstrate the ability to</b></p> <p>CO4.Understand the modeling of linear-time-invariant systems using transfer function and state- space representations.  CO5.Understand the concept of stability and its assessment for linear-time invariant systems.  CO6.Design simple feedback controllers.</p>
EE405PC	Power System - I	<p><b>At the end of this course, students will demonstrate the ability to</b></p> <p>CO7.Understand the concepts of power systems.  CO8.Understand the operation of conventional generating stations and renewable sources of electrical power.  CO9.Evaluate the power tariff methods.  CO10.Determine the electrical circuit parameters of transmission lines  CO11.Understand the layout of substation and underground cables and corona.</p>
EE407PC	Electrical Machines Lab - II	<p><b>After the completion of this laboratory course, the student will be able</b></p> <p>CO12.Assess the performance of different machines using different testing methods  CO13.To convert the Phase from three phase to two phase and vice versa  CO14.Compensate the changes in terminal voltages of synchronous generator after estimating the change by different methods  CO15.Control the active and reactive power flows in synchronous machines  CO16.Start different machines and control the speed and power factor</p>
EE408PC	Control Systems Lab	<p><b>After completion of this lab the student is able to</b></p> <p>CO17.How to improve the system performance by selecting a suitable controller and/or a compensator for a specific application  CO18.Apply various time domain and frequency domain techniques to assess the system performance  CO19.Apply various control strategies to different applications(example: Power systems, electrical drives etc)  CO20.Test system controllability and observability using state space</p>

		representation and applications of state space representation to various systems
--	--	--

Code	Course Name	Course Outcomes
<b>III B. Tech I Semester</b>		
EE501PE	Power Electronics	<b>At the end of this course students will demonstrate the ability to</b> CO1. Understand the differences between signal level and power level devices. CO2. Analyze controlled rectifier circuits. CO3. Analyze the operation of DC-DC choppers. CO4. Analyze the operation of voltage source inverters.
EE502PE	Power System-II	<b>At the end of this course students will demonstrate the ability to</b> CO5. Analyze transmission line performance. CO6. Apply load compensation techniques to control reactive power CO7. Understand the application of per unit quantities. CO8. Design over voltage protection and insulation coordination CO9. Determine the fault currents for symmetrical and unbalanced faults
EE503PE	Measurements & Instrumentation	<b>At the end of this course students will demonstrate the ability to</b> CO10. Understand different types of measuring instruments, their construction, operation and characteristics CO11. Identify the instruments suitable for typical measurements CO12. Apply the knowledge about transducers and instrument transformers to use them effectively. CO13. Apply the knowledge of smart and digital metering for industrial applications
EE512PE	High Voltage Engineering	<b>At the end of this course students will demonstrate the ability to</b> CO14. Understand the basic physics related to various breakdown processes in solid, liquid and gaseous insulating materials. CO15. Knowledge of generation and measurement of D. C., A.C., & Impulse voltages. CO16. Knowledge of tests on H. V. equipment and on insulating materials, as per the standards. CO17. Knowledge of how over-voltages arise in a power system, and protection against these over voltages.
EE505PC	Power System Simulation Lab	<b>At the end of this course students will demonstrate the ability to</b> CO18. Perform various transmission line calculations CO19. Understand Different circuits time constants CO20. Analyze the experimental data and draw the conclusions

EE506PC	Power Electronics Lab	<b>After completion of this course, the student is able to</b> CO21.Understand the operating principles of various power electronic converters. CO22.Use power electronic simulation packages& hardware to develop the power converters. CO23. Analyze and choose the appropriate converters for various applications
EE507PC	Measurements and Instrumentation Lab	<b>After completion of this lab the student is able to</b> CO24.To choose instruments CO25.Test any instrument CO26.Find the accuracy of any instrument by performing experiment CO27.Calibrate PMMC instrument using D.C potentiometer

Code	Course Name	Course Outcomes
<b>III B. Tech II Semester</b>		
EE512PE	High Voltage Engineering	<b>At the end of the course, the student will demonstrate</b> CO1.Understand the basic physics related to various breakdown processes in solid, liquid and gaseous insulating materials. CO2.Knowledge of generation and measurement of D. C., A.C., & Impulse voltages. CO3.Knowledge of tests on H. V. equipment and on insulating materials, as per the standards. CO4.Knowledge of how over-voltages arise in a power system, and protection against these over voltages
EE612PE	Power Semiconductor Drives	<b>After completion of this course the student is able to</b> CO5.Identify the drawbacks of speed control of motor by conventional methods. CO6.Differentiate Phase controlled and chopper-controlled DC drives speed-torque characteristics merits and demerits CO7.Understand Ac motor drive speed–torque characteristics using different control strategies its merits and demerits CO8.Describe Slip power recovery schemes

EE603PC	Power System Protection	<b>At the end of the course the student will be able to</b> CO9. Compare and contrast electromagnetic, static and microprocessor-based relays CO10. Apply technology to protect power system components. CO11. Select relay settings of over current and distance relays. CO12. Analyze quenching mechanisms used in air, oil and vacuum circuit breakers
EE604PC	Power System Operation and Control	<b>At the end of the course the student will be able to:</b> CO13. Understand operation and control of power systems. CO14. Analyze various functions of Energy Management System (EMS) functions. CO15. Analyze whether the machine is in stable or unstable position. CO16. Understand power system deregulation and restructuring
EE605PC	Power System Lab	<b>After completion of this lab, the student will be able to</b> CO17. Perform various load flow techniques CO18. Understand Different protection methods CO19. Analyze the experimental data and draw the conclusions

**1. Course Out Comes (Co's) And Program Out Comes (Po's):B.Tech II Year I & II Semesters: Civil JNTUH-R18 Regulations**

Code	Course Name	Course Outcomes
<b>B. Tech. II Year I Semester</b>		
MA304BS	Probability and Statistics	<b>At the end of this course, each student should be able to:</b> CO1. Formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data.
		PO1 The ideas of probability and random variables and various discrete and continuous probability distributions and their properties PO2: The basic ideas of statistics including measures of central tendency, correlation and regression PO3: The statistical methods of studying data samples

<p style="text-align: center;"><b>CE303PC</b></p>	<p style="text-align: center;"><b>STRENGTH OF MATERIALS - I</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Describe the concepts and principles, understand the theory of elasticity including strain/displacement and Hooke's law relationships</p> <p>CO2. Determine the stresses and strains in the members subjected to axial, bending.</p> <p>CO3. Evaluate the slope and deflection of beams subjected to loads.</p> <p>CO4. Determine the principal stresses and strains in structural members</p> <hr/> <p>PO1: The subject provide the knowledge of simple stress strains flexural</p> <p>PO2: Stresses in members, shear stresses and deflection in beams so that the concepts can be applied to the Engineering problems.</p>
<p style="text-align: center;"><b>CE305PC</b></p>	<p style="text-align: center;"><b>FLUID MECHANICS</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Apply conservation laws to derive governing equations of fluid flows.</p> <p>CO2. Compute hydrostatic and hydrodynamic forces.</p> <p>CO3. Analyze and design simple pipe systems.</p> <p>CO4. Apply principles of dimensional analysis to design experiments.</p> <p>CO5. Compute drag and lift coefficients.</p> <hr/> <p>PO1: Develop an appreciation for the properties of Newtonian fluids.</p> <p>PO2: Study analytical solutions to variety of simplified problems.</p> <p>PO3: Understand the dynamics of fluid flows and the governing non-dimensional parameters.</p> <p>PO4: Apply concepts of mass, momentum and energy conservation to flows.</p> <p>PO5: Grasp the basic ideas of turbulence.</p>



<b>CE301PC</b>	<b>SURVEYING AND GEOMATICS</b>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Apply the knowledge to calculate angles, distances and levels</p> <p>CO2. Identify data collection methods and prepare field notes</p> <p>CO3. Understand the working principles of survey instruments, measurement errors and corrective Measures</p> <p>CO4. Interpret survey data and compute areas and volumes, levels by different type of equipment and relate the knowledge to the modern equipment and methodologies</p> <hr/> <p>PO1: Know the principle and methods of surveying</p> <p>PO2. Measure horizontal and vertical- distances and angles</p> <p>PO3. Recording of observation accurately</p> <p>PO4. Perform calculations based on the observation</p> <p>PO5. Identification of source of errors and rectification methods</p> <p>PO6. Apply surveying principles to determine areas and volumes and setting out curves</p> <p>PO7. Use modern surveying equipment's for accurate results</p>
----------------	------------------------------------	---

<p style="text-align: center;"><b>CE302PC</b></p>	<p style="text-align: center;"><b>ENGINEERING GEOLOGY</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Understand weathering process and mass movement  CO2. Distinguish geological formations  CO3. Identify geological structures and processes for rock mass quality  CO4. Identify subsurface information and groundwater potential sites through geophysical investigations.  CO5. Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels</p> <hr/> <p>PO1. Introduction to Importance of geology from Civil Engineering point of view  PO2. Weathering of Rocks- Its effect over the properties of rocks importance of weathering  PO3. Mineralogy, Definition of mineral, Importance of study of minerals  PO4. Petrology, Definition of rock: Geological classification of rocks into igneous, Sedimentary and metamorphic rocks.  PO5. Structural Geology- Out crop, strike and dip study of common geological structures associating with the rocks such as folds, faults uncomformities, and joints.  PO6. Earth Quakes- Causes and effects, shield areas and seismic belts. Seismic waves, Richter Scale.</p>
<p style="text-align: center;"><b>CE307PC</b></p>	<p style="text-align: center;"><b>STRENGTH OF MATERIALS LAB</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Conduct tension test on Materials like steel etc.  CO2. Conduct compression tests on spring, wood and concrete.  CO3. Conduct flexural and torsion test to determine elastic constants  CO4. Determine hardness of metals</p> <hr/> <p>PO1: The objective of the course is to make the student understand the behavior of materials under different types of loading for different types structures</p>

<p style="text-align: center;"><b>CE306PC</b></p>	<p style="text-align: center;"><b>Engineering Geology Lab</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Study of physical properties and identification of minerals referred under theory.  CO2. Megascopic description and identification of rocks referred under theory.  CO3. Microscopic study of rocks.  CO4. Interpretation and drawing of sections for geological maps showing tilted beds, faults, uniformities etc.  CO5. Simple Structural Geology problems.  CO6. Electrical resistivity meter.</p> <hr/> <p>PO1: The object of this lab is that to provide practical knowledge about physical properties of minerals, rocks, drawing of geological maps, showing faults, uniformities etc.</p>
<p style="text-align: center;"><b>CE308ES</b></p>	<p style="text-align: center;"><b>SURVEYING LAB –I</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Surveying of an area by chain survey (closed traverse) &amp; plotting.  CO2. Chaining across obstacles  CO3. Determine of distance between two inaccessible points with compass  CO4. Survey of a given area by prismatic compass (closed traverse) and plotting after adjustment.  CO5. Radiation method, intersection methods by plane table survey.  CO6. Two point and three point problems in plane table survey.  CO7. Levelling – Longitudinal and cross-section and plotting  CO8. Trigonometric leveling using theodolite  CO9. Height and distances using principles of tacheometric surveying  CO10. a) Measurement of Horizontal angle &amp; vertical angle.  b) Distance between inaccessible point by theodolite.</p>

		<p>PO1: To impart the practical knowledge in the field, it is essential to introduce in curriculum.</p> <p>PO2: Drawing of Plans and Maps and determining the area are pre requisites before taking up any Civil Engineering works.</p>
*MC309	CONSTITUTION OF INDIA	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Meaning of the constitution law and constitutionalism  CO2. Historical perspective of the Constitution of India  CO3. Salient features and characteristics of the Constitution of India  CO4. Scheme of the fundamental rights.  CO5. The scheme of the Fundamental Duties and its legal status  CO6. The Directive Principles of State Policy – Its importance and implementation.  CO7. Scope of the Right to Life and Personal Liberty under Article 21</p>
		<p>PO1. The Constitution of India is the supreme law of India  PO2. The Constitution of India reflects the idea of “Constitutionalism”  PO3. No law can be “static” and therefore the Constitution of India has also been amended more than one hundred times  PO4. To expose the students to debates on the politics and economics of work.</p>
<b>B. Tech. II Year II Semester</b>		
		<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Determine stresses in the member subjected to Torsion  CO2. Analyze columns and struts  CO3. Understand the concept of direct and bending stresses  CO4. Analyze and design springs, thin and thick cylinders  CO5. Understand the concept of unsymmetrical bending.</p>

<p><b>CE404PC</b></p>	<p><b>STRENGTH OF MATERIALS – II</b></p>	<p>PO1. Study of the subject provides the understanding of principal stress, strains, springs, columns, and structures</p> <p>PO2. Bending Moment Equations, Section Modulus.</p> <p>PO3. Study Of The Columns And Struts.</p> <p>PO4. Analysis And Design Of Beams Curved In Plan</p> <p>PO5. Knowing OF Thin Cylinder and Thick Cylinders:</p> <p>PO6. Unsymmetrical Bending Of Beams And Columns</p> <p>PO7. Shear Centre Location For Different Sections Like Circular And L- Sections</p> <p>PO8. Torsion Of Circular Shafts</p>
-----------------------	--	---

<p style="text-align: center;"><b>CE405PC</b></p>	<p style="text-align: center;"><b>Hydraulics And Hydraulic Machines</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Understand the concepts of channel flows.  CO2. Compute flow profiles in channel transitions and analyze hydraulic transients  CO3. Design the working proportions of hydraulic machines</p>
		<p>PO1. Analysing And Making Most economical sections for sections like rectangular , circular and trapezoidal.(Open Channel flow 1)  PO2. Open Channel Flow -2(Non Uniform Flows And Their Characteristics)  PO3. Dimension And Analysis Of Hydraulic Similitude  PO4. Hydraulic Turbines Working And Principles  PO5. Centrifugal And Reciprocating Pumps Analysis And Design Of Respective Pumps And Their Efficiencies</p>
<p style="text-align: center;"><b>CE406PC</b></p>	<p style="text-align: center;"><b>STRUCTURAL ANALYSIS-1</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Analyze Perfect, Imperfect And Redundant Frames.  CO2. Formulate Equilibrium and compatibility equations for structural members  CO3. Analyze one dimensional and two dimensional problems using classical methods  CO4. Analyze indeterminate structures  CO5. Analyze structures for gravity loads, moving loads and lateral loads</p>
		<p>PO1. Introduction to Structures and Indeterminacy  PO2. Propped Cantilever and Fixed Beams  PO3. Frames and Analysis Of Perfect Frames  PO4. Energy Theorems, Introduction-Strain energy in linear elastic system  PO5. Three Hinged Arches – Introduction – Types of Arches  PO6. Slope Deflection Method, Derivation of slope-deflection equation, Moment Distribution Method  PO7. Moving Loads and Influence Lines</p>

EE401ES	Basic Electrical and Electronics Engineering	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. To analyze and solve electrical circuits using network laws and theorems.</p> <p>CO2. To understand and analyze basic Electric and Magnetic circuits</p> <p>CO3. To study the working principles of Electrical Machines</p> <p>CO4. To introduce components of Low Voltage Electrical Installations</p> <p>CO5. To identify and characterize diodes and various types of transistors</p>
		<p>PO1. To introduce the concepts of electrical circuits and its components</p> <p>PO2. To understand magnetic circuits, DC circuits and AC single phase &amp; three phase circuits</p> <p>PO3. To study and understand the different types of DC/AC machines and Transformers</p> <p>PO4. To impart the knowledge of various electrical installations.</p> <p>PO5. To introduce the concept of power, power factor and its improvement.</p> <p>PO6. To introduce the concepts of diodes &amp; transistors,</p> <p>PO7. To impart the knowledge of various configurations, characteristics and applications</p>
CE402ES	BASIC MECHANICAL ENGINEERING FOR CIVIL ENGINEERS	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. To understand the mechanical equipment for the usage at civil engineering systems</p> <p>CO2. To familiarize with the general principles and requirement for refrigeration, manufacturing</p> <p>CO3. To realize the techniques employed to construct civil engineering systems.</p>
		<p>PO1. Basic machine elements</p> <p>PO2. Sources of Energy and Power Generation</p> <p>PO3. Various manufacturing processes,</p> <p>PO4. Power transmission elements, material handling equipment</p>

<p style="text-align: center;"><b>CE403PC</b></p>	<p style="text-align: center;"><b>BUILDING MATERIALS , CONSTRUCTION AND PLANNING</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Define the Basic terminology that is used in the industry.  CO2. Categorize different building materials, properties and their uses.  CO3. Understand the Prevention of damage measures and good workmanship  CO4. Explain different building services</p>
		<p>PO1: To give the students a basic idea about the construction materials.  PO2: Building components and to introduce various methods.</p>
<p style="text-align: center;"><b>CE405PC</b></p>	<p style="text-align: center;"><b>Hydraulics And Hydraulic Machine LAB</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Determine coefficient of discharge for orifice and mouthpiece.  CO2. Calibrate notches venturimeter orificemeters  CO3. Determine minor losses in pipes</p>
		<p>PO1. To give the student an exposure to various hydraulic devices and PipeFlow.  PO2. Know The Discharge Flow Through Various Equipments Like Orifice And Venturimeters And Etc</p>
<p style="text-align: center;"><b>CE407PC</b></p>	<p style="text-align: center;"><b>Computer aided Civil Engineering Drawing</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Master the usage of AutoCAD commands for drawing 2D &amp; 3D building drawings required for different civil engineering applications  CO2. Introduction to computer aided drafting Software for CAD- Introduction to different softwares  CO3. Practice exercises on CAD software  CO4. Drawing of plans of buildings using software  a) Single storied buildings  b) multi storied buildings  CO5. Developing sections and elevations for a) Single storied buildings b) multi storied buildings  CO6. Detailing of building components like Doors, Windows, Roof Trusses etc. using CAD softwares  CO7. Exercises on development of working drawings of buildings</p>
		<p>PO1: The objective of this lab is to teach the student basic drawing fundamentals in various civil engineering applications, specially in building drawing.</p>



<p><b>EE409ES</b></p>	<p><b>BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. To analyze and solve electrical circuits using network laws and theorems</p> <p>CO2. To understand and analyze basic Electric and Magnetic circuits</p> <p>CO3. To study the working principles of Electrical Machines</p> <p>CO4. To introduce components of Low Voltage Electrical Installations</p> <p>CO5. To identify and characterize diodes and various types of transistors</p> <hr/> <p>PO1. To introduce the concepts of electrical circuits and its components</p> <p>PO2. To understand magnetic circuits, DC circuits and AC single phase &amp; three phase circuits</p> <p>PO3. To study and understand the different types of DC/AC machines and Transformers.</p> <p>PO4. To impart the knowledge of various electrical installations</p> <p>PO5. To introduce the concept of power, power factor and its improvement</p>
<p><b>*MC409</b></p>	<p><b>GENDER SENSITIZATION LAB</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Students will have developed a better understanding of important issues related to gender in contemporary India.</p> <p>CO2. Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.</p> <p>CO3. Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.</p> <hr/> <p>PO1. To develop students' sensibility with regard to issues of gender in contemporary India.</p> <p>PO2. To provide a critical perspective on the socialization of men and women</p> <p>PO3. To introduce students to information about some key biological aspects of genders.</p>

Code	Course Name	Course Outcomes
<b>B. Tech. III Year I Semester</b>		
<b>CE501PC</b>	<b>STRUCTURAL ANALYSIS – II</b>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. <b>Analyze</b> the two hinged arches  CO2. <b>Solve</b> statically indeterminate beams and portal frames using classical methods  CO3. <b>Sketch</b> the shear force and bending moment diagrams for indeterminate structures  CO4. <b>Formulate</b> the stiffness matrix and analyze the beams by matrix methods</p>
		<p>PO1. Identify the various actions in arches  PO2. Understand classical methods of analysis for statically indeterminate structures  PO3. Differentiate the approximate and numerical methods of analysis for indeterminate structures.  PO4. Find the degree of static and kinematic indeterminacies of the structures.  PO5. Plot the variation of S.F and B.M when a moving load passes on indeterminate structure</p>
<b>CE505PC</b>	<b>GEOTECHNICAL ENGINEERING</b>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Characterize and classify the soils  CO2. Able to estimate seepage, stresses under various loading conditions and compaction characteristics  CO3. Able to analyse the compressibility of the soils  CO4. Able to understand the strength of soils under various drainage conditions</p>
		<p>PO1. understand the formation of soil and classification of the soils  PO2. determine the Index &amp; Engineering Properties of Soils  PO3. determine the flow characteristics &amp; stresses due to externally applied loads  PO4. estimate the consolidation properties of soils  PO5. estimate the shear strength and seepage loss</p>

<p style="text-align: center;"><b>CE503PC</b></p>	<p style="text-align: center;"><b>STRUCTURAL ENGINEERING – I (RCC)</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. <b>Compare</b> and <b>Design</b> the singly reinforced, doubly reinforced and flanged sections</p> <p>CO2. <b>Design</b> the axially loaded, uniaxial and biaxial bending columns.</p> <p>CO3. <b>Classify</b> the footings and <b>Design</b> the isolated square, rectangular and circular footings</p> <p>CO4. <b>Distinguish</b> and <b>Design</b> the one-way and two-way slabs.</p>
<p style="text-align: center;"><b>CE504PC</b></p>	<p style="text-align: center;"><b>TRANSPORTATION ENGINEERING</b></p>	<p><b>At the end of this course, each student should be able to</b></p> <p>CO1. Understand Plan highway networks</p> <p>CO2. Design highway geometrics.</p> <p>CO3. Design Intersections and prepare traffic management plans.</p> <p>CO4. Design flexible and rigid pavements</p> <hr/> <p><b>PO1.</b> Deals with different components of Transportation Engineering like highway</p> <p><b>PO2.</b> Railway &amp; Airport Engineering Emphasis is a Geometric Design of different elements in Transportation Engineering</p> <p><b>PO3.</b> Pavement Design, Intersection Design, Traffic Engineering &amp; Regulations &amp; Highway Geometric Design</p>

<p style="text-align: center;"><b>CE511PE</b></p>	<p><b>CONCRETE TECHNOLOGY</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Identify Quality Control tests on concrete making materials</p> <p>CO2. Understand the behavior of fresh and hardened concrete</p> <p>CO3. Design concrete mixes as per IS and ACI codes</p> <p>CO4. Understand the durability requirements of concrete</p> <p>CO5. Understand the need for special concretes</p>
		<p>PO1. Concrete is the basic construction material in the advanced present construction industry. Lot of advances are taking place in the concrete technology on par with Development taking place in the engineering.</p> <p>PO2. The present day industry needs the knowledge of concrete technology thoroughly.</p> <p>PO3. The subject is designed to give the basic knowledge as well as latest developments in concrete technology</p>
<p style="text-align: center;"><b>SM505MS</b></p>	<p><b>ENGINEERING ECONOMICS AND ACCOUNTANCY</b></p>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. To perform and evaluate present and future worth of the alternate projects and to appraise projects by using traditional and DCF Methods. To carry out cost benefit analysis of project and to calculate BEP of different alternative projects.</p>
		<p>PO1. To prepare engineering students to analyze cost/ revenue/ financial data and to make economic and financial analysis in decision making process and to examine the performance of companies engaged in engineering.</p>

Code	Course Name	Course Outcomes
CE506PC	Highway Engineering and Concrete Technology Lab	<p><b>At the end of this course, each student should be able to</b></p> <p>CO1. Categorize the test on materials used Civil Engineering Building &amp; Pavement constructions</p> <p>CO2. To perform the tests on concrete for its characterization</p> <p>CO3. To Design Concrete Mix Proportioning by Using Indian Standard Method.</p> <p>CO4. Examine the tests performed for Bitumen mixes.</p> <p>CO5. To prepare a laboratory report</p>
		<p>PO1. To learn laboratory tests and their procedures cement, fine aggregate, coarse aggregates and Bitumen</p> <p>PO2. To Evaluate fresh concrete properties</p> <p>PO3. To Understand the test procedures for characterization of Concrete and bituminous mixes</p>
CE507PC	GEOTECHNICAL ENGINEERING LAB	<p><b>At the end of this course, each student should be able to</b></p> <p>CO1. At the end of the course, the student will be able to Classify and evaluate the behavior of the soils subjected to various loads.</p> <p>PO1. To obtain index and engineering properties of locally available soils, and to understand the behavior of these soil under various loads.</p>
EN508HS	ADVANCE COMMUNICATION SKILLS LAB	<p><b>At the end of this course, each student should be able to</b></p> <p>CO1. Acquire vocabulary and use it contextually</p> <p>CO2. Listen and speak effectively</p> <p>CO3. Develop proficiency in academic reading and writing</p> <p>CO4. Increase possibilities of job prospects</p> <p>CO5. Communicate confidently in formal and informal contexts</p> <p>PO1. This Lab focuses on using multi-media instruction for language development to meet the following targets:</p> <p>PO2. To make students industry-ready</p> <p>PO3. To read and comprehend texts in different contexts</p> <p>PO4. To enable them to listen to English spoken at normal conversational speed</p>

MC509	<b>INTELLECTUAL PROPERTY RIGHTS</b>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. The students will understand the importance of Values and Ethics in their personal lives and professional careers.</p> <p>CO2. Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting, and evaluating trade mark, trade mark registration processes</p> <hr/> <p><b>PO1.</b> Introduction to Intellectual property  <b>PO2.</b> Law of copy rights  <b>PO3.</b> New development of intellectual property  <b>PO4.</b> Trade Secrets</p>
-------	-------------------------------------	---

**B. Tech. III Year II Semester**

CE601PC	<b>HYDROLOGY AND WATER RESOURCES ENGINEERING</b>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Understand the different concepts and terms used in engineering hydrology</p> <p>CO2. To <b>identify and</b> explain various formulae used in estimation of surface and Ground water hydrology components</p> <p>CO3. Demonstrate their knowledge to <b>connect hydrology to the field requirement</b></p> <hr/> <p><b>PO1.</b> This course provides the description of hydrological cycle and derive various formulas used in estimation of different basic components of surface and Ground water cycle.</p> <p><b>PO2.</b> Further it will explain the water requirement for irrigation and connectivity of hydrology to the field requirement.</p>
---------	--	---

CE602PC	<b>ENVIRONMENTAL ENGINEERING</b>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Analyze characteristics of water and wastewater</p> <p>CO2. Estimate the quantity of drinking water and domestic wastewater generated</p> <p>CO3. Design components of water supply systems Design sewerage system</p>
---------	----------------------------------	---

		<p><b>PO1.</b> Introduction: Waterborne diseases – protected water supply.</p> <p><b>PO2.</b> Layout and general outline of water treatment units.</p> <p><b>PO3.</b> Distribution systems requirement –method and layouts -Design procedures.</p> <p><b>PO4.</b> characteristics of sewage And Waste water treatment plant</p>
--	--	---

Code	Course Name	Course Outcomes
CE603PC	<b>FOUNDATION ENGINEERING</b>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. understand the principles and methods of Geotechnical Exploration  CO2. decide the suitability of soils and check the stability of slopes  CO3. calculate lateral earth pressures and check the stability of retaining walls  CO4. analyze and design the shallow and deep foundations</p> <hr/> <p><b>PO1.</b> To Plan Soil exploration program for civil Engineering Projects  <b>PO2.</b> To check the stability of slopes  <b>PO3.</b> To determine the lateral earth pressures and design retaining walls  <b>PO4.</b> To determine the Bearing capacity of Soil  <b>PO5.</b> To design pile group foundation</p>
CE604PC	<b>STRUCTURAL ENGINEERING – II (STEEL)</b>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Analyze the tension members, compression members  CO2. Design the tension members, compression members and column bases and joints and connections  CO3. Analyze and Design the beams including built-up sections and beam and connections.  CO4. Identify and Design the various components of welded plate girder including stiffeners</p> <hr/> <p><b>PO1.</b> Explain the mechanical properties of structural steel, plasticity, yield.  <b>PO2. Describe</b> the salient features of Limit State Method of design of Steel structures.  <b>PO3. Identify and explain</b> the codal provisions given in IS. 800.  <b>PO4. Analyze</b> the behavior of steel structures under tension, compression and flexure.</p>
CE611PE	<b>PRESTRESSED CONCRETE</b>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Acquire the knowledge of evolution of process of pre-stressing  CO2. Acquire the knowledge of various pre-stressing techniques.  CO3. Develop skills in analysis design of pre-stressed structural elements as per the IS codal provisions</p>



		<p><b>PO1.</b> Understand the principles &amp; necessity of pre-stressed concrete structures</p> <p><b>PO2.</b> Know different techniques of pre-stressing.</p> <p><b>PO3.</b> Get the knowledge on various losses of pre-stress.</p>
<b>MC609</b>	<b>ENVIRONMENTAL SCIENCE</b>	<p><b>At the end of this course, each student should be able to:</b></p> <p><b>CO1.</b> Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development</p>
		<p><b>PO1.</b> Understanding the importance of ecological balance for sustainable development</p> <p><b>PO2.</b> Understanding the impacts of developmental activities and mitigation measures</p> <p><b>PO3.</b> Understanding the environmental policies and regulations</p>
<b>CE606PC</b>	<b>COMPUTER AIDED DESIGN - LAB</b>	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Model the geometry of real-world structure Represent the physical model of structural element/structure</p> <p>CO2. Perform analysis</p> <p>CO3. Interpret from the Post processing results</p> <p>CO4. Detailing of reinforcement in RC isolated footings square, rectangular, circular and combined footings.</p> <p>CO5. Design the structural elements and a system as per IS Codes</p> <hr/> <p><b>PO1.</b> Learn the usage of any fundamental software for design</p> <p><b>PO2.</b> Create geometries using pre-processor</p> <p><b>PO3.</b> Analyze and Interpret the results using post processor</p> <p><b>PO4.</b> Design the structural elements</p>

Code	Course Name	Course Outcomes
CE605PC	ENVIRONMENTAL ENGINEERING LAB	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Understand about the equipment used to conduct the test procedures</p> <p>CO2. Perform the experiments in the lab</p> <p>CO3. Examine and Estimate water, waste water, air and soil Quality</p> <p>CO4. Compare the water, air quality standards with prescribed standards set by the local governments</p> <p>CO5. Develop a report on the quality aspect of the environment</p> <hr/> <p><b>PO1. Perform</b> the experiments to determine water and waste water quality</p> <p><b>PO2. Understand</b> the water &amp; waste water sampling, their quality standards</p> <p><b>PO3. Estimate</b> quality of water, waste water, Industrial water</p>
<b>B. Tech. IV Year I Semester</b>		
CE711PE	REMOTE SENSING & GIS	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. <b>Describe</b> different concepts and terms used in Remote Sensing and its data</p> <p>CO2 Understand the Data conversion and Process in different coordinate systems of GIS interface.</p> <p>CO3. Design Intersections and prepare traffic management plans.</p> <p>CO4. <b>Evaluate</b> the accuracy of Data and implementing a GIS.</p> <hr/> <p><b>PO1.</b> Know the concepts of Remote Sensing, its interpreting Techniques and concepts of Digital images</p> <p><b>PO2.</b> know the concept of Geographical Information System (GIS), coordinate system GIS Data and its types</p> <p><b>PO3.</b> Understand the students managing the spatial Data Using GIS</p>
CE701PC	Estimation, Costing and Project Management	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. understand the technical specifications for various works to be performed for a project and how they impact the cost of a structure.</p> <p>CO2. quantify the worth of a structure by evaluating quantities of constituents, derive their cost rates and build up the overall cost of the structure.</p> <p>CO3. understand how competitive bidding works and how to submit a competitive bid proposal</p> <p>CO4. An idea of how to optimize construction projects based on costs</p>

		<p><b>PO1.</b> The subject provide process of estimations required for various work in construction.</p> <p><b>PO2.</b> To have knowledge of using SOR &amp; SSR for analysis of rates on various works and basics of planning tools for a construction projects</p>
<b>CE712PE</b>	<b>GROUND IMPROVEMENT TECHNIQUES</b>	<p><b>At the end of this course, each student shouldbe able to:</b></p> <p>CO1. Know the necessity of ground improvement</p> <p>CO2. Understand the various ground improvement techniques available.</p> <p>CO3. Select &amp; design suitable ground improvement technique for existing soil conditions in the field.</p>
		<p><b>PO1.</b> To know the need of ground improvement</p> <p><b>PO2.</b> To acquire the knowledge on the various ground improvement techniques available and their applications for different types of soils</p> <p><b>PO3.</b> To understand suitable ground improvement technique for given soil conditions</p>
<b>CE713PE</b>	<b>ADVANCED STRUCTURAL DESIGN</b>	<p><b>At the end of this course, each student shouldbe able to:</b></p> <p>CO1. Enhance the capabilities to design the special structural elements as per Indian standard code of practice.</p> <p>CO2. Analyze, design, draw and detailing of critical structural components with a level of accuracy</p>
		<p>PO1. To make the student more conversant with the design principles of critical structures using limit state approach</p> <p>PO2. Design of RCC Circular Water Tanks</p> <p>PO3 Flat slabs, Ribbed slabs, Design of Steel Gantry Girders</p>

Code	Course Name	Course Outcomes
CE721PE	IRRIGATION AND HYDRAULIC STRUCTURES	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Know types of water retaining structures for multiple purposes and its key parameters considered for planning and designing</p> <p>CO2. Understand details in any Irrigation System and its requirements.</p> <p>CO3. Know, Analyze and Design of a irrigation system components</p>
		<p><b>PO1.</b> To study various types of storage works and, diversion headwork, their components and design principles for their construction.</p> <p><b>PO2.</b> Storage Works-Reservoirs, Gravity dams</p> <p><b>PO3.</b> Earth dams, Diversion Head works and Canal Falls</p>
CE722PE	PIPELINE ENGINEERING	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. Get an understanding of the key steps in a pipeline's lifecycle: design, construction, installation ,asset management and maintenance.</p>
		<p><b>PO1.</b> To familiarize the students with the various elements and stages involved in transportation of water</p> <p><b>PO2</b> To understand standards and practices in piping design.</p> <p><b>PO3.</b> To know various equipment and their operation in pipeline transportation</p> <p><b>PO4.</b> To understand technology in transportation of fluids</p>
CE723PE	GROUND WATER HYDROLOGY	<p><b>At the end of this course, each student should be able to:</b></p> <p>CO1. <b>Identify</b> different fundamental equations and concepts as applied in the Groundwater studies.</p> <p>CO2. <b>Discuss</b> and derive differential equation governing groundwater flow in three dimensions</p> <p>CO3. To <b>solve</b> groundwater mathematical equations and analyze pumping tests in steady and non steady flow cases</p> <p>CO4. <b>Distinguish</b> and understand the saline water intrusion problem in costal aquifers</p> <p><b>PO1. To explain</b> the concepts of Groundwater Development and Management.</p> <p><b>PO2. To demonstrate and</b> derive the basic equations used in Groundwater development and management and the corresponding equations</p> <p><b>PO3.</b> To know the investigations, field studies to conduct basic ground water studies</p>
<b>B. Tech. IV Year II Semester</b>		

CE811PE	Solid Waste Management	<p><b>At the end of this course, each student should be able to:</b>  CO1 Identify the physical and chemical composition of solid wastes  CO2. Analyze the functional elements for solid waste management.  CO3. Understand the techniques and methods used in transformation, conservation, and recovery of materials from solid wastes.  CO4. Identify and design waste disposal systems</p> <hr/> <p><b>PO1. Define</b> the terms <b>and Understands</b> the necessity of solid waste management  <b>PO2. Explain</b> the strategies for the collection of solid waste  <b>PO3. Describe</b> the solid waste disposal methods  <b>PO4. Categorize</b> Hazardous Waste</p>
CE812PE	<b>ENVIRONMENTAL IMPACT ASSESSMENT</b>	<p><b>At the end of this course, each student should be able to:</b>  CO1. Identify the environmental attributes to be considered for the EIA study.  CO2. Formulate objectives of the EIA studies.  CO3. Identify the methodology to prepare rapid EIA  CO4. Prepare EIA reports and environmental management plans</p> <hr/> <p><b>PO1. Define and Classify</b> Environmental Impacts and the terminology  <b>PO2. Understands</b> the environmental Impact assessment procedure  <b>PO3. Explain</b> the EIA methodology, <b>List and describe</b> environmental audits</p>
CE813PE	<b>AIR POLLUTION</b>	<p><b>At the end of this course, each student should be able to:</b>  CO1. Identify sampling and analysis techniques for air quality assessment  CO2. Describe the plume behavior for atmospheric stability conditions  CO3. Apply plume dispersion modelling and assess the concentrations</p>

		<p>PO1. <b>Understand the</b> Air pollution Concepts</p> <p>PO2. <b>Identify</b> the source of air pollution</p> <p>PO3. <b>Know</b> Air pollution Control devices.</p> <p>PO4. <b>Distinguish the</b> Air quality monitoring devices</p>
CE821PE	AIRPORT, RAILWAYS, AND WATERWAYS	<p>CO1. An ability to design of runways and taxiways</p> <p>CO2. An ability to design the infrastructure for large and small airports</p> <p>CO3. An ability to design various crossings and signals in Railway Projects.</p> <p>CO4. An ability plan the harbors and ports projects including the infrastructure required for new ports and harbors.</p>
		<p>PO1. Deal with the characteristics of aircrafts related to airport design; runway and taxiway design ,runway orientation, length, grading and drainage.</p> <p>PO2. Introduce component of railway tracks, train resistance, crossing, signaling, high speed tracks and Metro Rail</p> <p>PO3. Explain the classes of harbors, features, planning and design of port facilities.</p>
CE822PE	URBAN TRANSPORTATION PLANNING	<p>CO1.to know the exactly the requirement of planning of a transport system</p>
		<p>PO1. Transport Planning Process, Scope – interdependence of land use and traffic</p> <p>PO2. Trip Generation, Trip Distribution Methods</p> <p>PO3. Modal split analysis And Route assignment</p>
CE823PE	FINITE ELEMENT METHODS FOR CIVIL ENGINEERING	<p>CO1. At the end of the course the student will able to Analyze simple structural element using Finite Element approach</p>
		<p>PO1. The subject provides introduction to finite element methods to analyze structural elements</p>

**1. B. Tech-Electronics and Communication Engineering: II, III & IV  
years, JNTUH-R18&R16 Regulations**

**II B. Tech I Semester (R18)**

### II B. Tech I Semester

II B. Tech I Semester		
C211	EC301PC	Electronic Devices and Circuits
C212	EC302PC	Network Analysis and Transmission Lines
C213	EC303PC	Digital System Design
C214	EC304PC	Signal and Systems
C215	EC305ES	Probability Theory and Stochastic processes

## Electronic Devices and Circuits

Course Outcome	Statement
C211.1	CO1: Know the characteristics of various components.
C211.2	CO2: Understand the utilization of components.
C211.3	CO3: Understand the biasing techniques
C211.4	CO4: Design and analyze small signal amplifier circuits.

## Network Analysis and Transmission Lines

Course Outcome	Statement
C212.1	CO1: Gain the knowledge on basic RLC circuits behavior.
C212.2	CO2: Analyze the Steady state and transient analysis of RLCCircuits.
C212.3	CO3: Know the characteristics of twoport network parameters.
C212.4	CO4: Analyze the transmission line parameters and configurations.



## Digital System Design

Course Outcome	Statement
C213.1	CO1: Understand the numerical information in different forms and Boolean Algebra theorems
C213.2	CO2: Postulates of Boolean algebra and to minimize combinational functions
C213.3	CO3: Design and analyze combinational and sequential circuits
C213.4	CO4: Know about the logic families and realization of logic gates.

## Signal and Systems

Course Outcome	Statement
C214.1	CO1: Differentiate various signal functions.
C214.2	CO2: Represent any arbitrary signal in time and frequency domain.
C214.3	CO3: Understand the characteristics of linear time invariant systems.
C214.4	CO4: Analyze the signals with different transform technique

## Probability Theory and Stochastic processes

Course Outcome	Statement
C215.1	CO1. Understand the gains concept and acquire the knowledge on Basic network elements.
C215.2	CO2. Understand and analyze the RLC circuits' behavior in detail.
C215.3	CO3. Analyze and understand the performance of periodic waveforms.
C215.4	CO4. Understand and learns the concept of the gain, and knowledge in the characteristics of two port network parameters (Z, Y, ABCD, h & g).
C215.5	CO5. To analyze the filter design concepts in real world applications
C215.6	CO6. Understand the concept of attenuator, image transfer constant, and impedance matching network.

II B. Tech II Semester		
C221	EC402PC	Electromagnetic Fields and Waves
C222	EC403PC	Analog and Digital Communications
C223	EE404PC	Linear IC Applications
C224	EC405PC	Electronic Circuit Analysis

### Electromagnetic Fields and Waves

Course Outcome	Statement
C221.1	CO1: Get the knowledge of Basic Laws, Concepts and proofs related to Electrostatic Fields and Magneto static Fields.
C221.2	CO2: Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.
C221.3	CO3: Analyze the Wave Equations for good conductors, good dielectrics and evaluate the UPW Characteristics for several practical media of interest.
C221.4	CO4: To analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems.

## Analog and Digital Communications

Course Outcome	Statement
C222.1	CO1. Analyze and design of various continuous wave and angle modulation and demodulation techniques
C222.2	CO2. Understand the effect of noise present in continuous wave and angle modulation techniques.
C222.3	CO3. Attain the knowledge about AM, FM Transmitters and Receivers
C222.4	CO4. Analyze and design the various Pulse Modulation Techniques.
C222.5	CO5. Understand the concepts of Digital Modulation Techniques and Baseband transmission.

## Linear IC Applications

Course Outcome	Statement
C223.1	CO1. A thorough understanding of operational amplifiers with linear integrated circuits.
C223.2	CO2. Attain the knowledge of functional diagrams and applications of IC555 and IC565
C223.3	CO3. Acquire the knowledge about the Data converters.

## Electronic Circuit Analysis

Course Outcome	Statement
C224.1	CO1. Design the multistage amplifiers and understand the concepts of High Frequency Analysis of Transistors.
C224.2	CO2. Utilize the Concepts of negative feedback to improve the stability of amplifiers and positive feedback to generate sustained oscillations
C224.3	CO3. Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio and Radio applications.
C224.4	CO4. Design Multivibrators and sweep circuits for various applications.

III B. Tech I Semester		
C311	EC501PC	Microprocessors & Microcontrollers
C312	EC502PC	Control Systems
C313	EC503PC	Electronic Measurements and Instrumentation

### Microprocessors & Microcontrollers

Course Outcome	Statement
C311.1	CO1. Understand the internal architecture, organization and assembly language programming of 8086 processors.
C311.2	CO2. Understand the internal architecture, organization and assembly language programming of 8051/controllers
C311.3	CO3. Understand the interfacing techniques to 8086 and 8051 based systems.
C311.4	CO4. Understand the internal architecture of ARM processors and basic concepts of advanced ARM processors.

## Control Systems

Course Outcome	Statement
C313.1	CO1. Understand the modeling of linear-time-invariant systems using transfer function and state-space representations.
C313.2	CO2. Understand the concept of stability and its assessment for linear-time invariant systems.
C313.3	CO3. Design simple feedback controllers.

## Electronic Measurements and Instrumentation

Course Outcome	Statement
C314.1	CO1. Measure electrical parameters with different meters and understand the basic definition of measuring parameters.
C314.2	CO2. Use various types of signal generators, signal analyzers for generating and analyzing various real-time signals.
C314.3	CO3. Operate an Oscilloscope to measure various signals.
C314.4	CO4. Measure various physical parameters by appropriately selecting the transducers.



III B. Tech II Semester		
C321	EC601PC	Antennas and Wave Propagation
C322	EC602PC	Digital Signal Processing
C323	EC603PC	VLSI Design
C324	EC604PE	MCN

### Antennas and Wave Propagation

Course Outcome	Statement
C321.1	CO1.Characterizetheantennasbasedonfrequency,configurethegeometryandestablishtheradiationpatternsofVHF,UHFand Microwaveantennasandalso antennaarrays.
C321.2	CO2.Specifytherequirementsformicrowavemeasurementsandarrangeasetuptocarry outtheantenna farzone pattern and gainmeasurementsin the laboratory.
C321.3	CO3.Classifythedifferentwavepropagationmechanisms,determinethecharacteristicf eaturesofdifferentwavepropagations,andestimate theparametersinvolved.

### Digital Signal Processing

Course Outcome	Statement
C323.1	CO1. UnderstandtheLTI systemcharacteristicsandMultiratesignal processing.
C323.2	CO2. Understandtheinter-relationshipbetweenDFTandvarioustransforms.
C323.3	CO3. Designadigitalfilterfor agiven specification.
C323.4	CO4. Understandthesignificanceofvariousfilterstructuresandeffectsofroundofferrors.

## VLSI Design

Course Outcome	Statement
C323.1	CO1. Acquire qualitative knowledge about the fabrication process of integrated circuits using MOS transistors.
C323.2	CO2. Draw the layout of any logic circuit which helps to understand and estimate parasitic effect of any logic circuit.
C323.3	CO3. Design building blocks of data path systems, memories and simple logic circuits using PLA, PAL, FPGA and CPLD.
C323.4	CO4. Understand different types of faults that can occur in a system and learn the concept of testing and adding extra hardware to improve the stability of the system.

## Mobile Communications and Networks

Course Outcome	Statement
C324.1	CO1. Know the evolution of cellular and mobile communication systems.
C324.2	CO2. The student will be able to understand Co-Channel and Non-Co-Channel interferences.
C324.3	CO3. Understand impairments due to multipath fading channels and how to overcome the different fading effects.
C324.4	CO4. Familiar with cell coverage for signal and traffic, diversity, techniques, frequency management, Channel assignment and types of handoff.
C324.5	CO5. Know the difference between cellular and Adhoc Networks and design goals of MAC Layer protocol.

IV B. Tech I Semester		
C411	EC701PC	Microwave Engineering
C412		
C413	EC731PE	Professional Elective - III: Radar Systems
C414	EC742PE	Professional Elective - IV: EMI
C415	EC702PC	VLSI Design

### Microwave Engineering

Course Outcome	Statement
C411.1	CO1. Understand the significance microwaves and microwave transmission lines.
C411.2	CO2. Analyze wave propagation in TE, TM or TEM modes, in structures such as rectangular waveguides.
C411.3	CO3. Compare the passive microwave components and applications such as directional couplers, power dividers/ combiner and etc., with given characteristics.
C411.4	CO4. Analyze and design microwave resonators.
C411.5	CO5. Analyze the characteristics of microwave tubes and compare them..
C411.6	CO6. Understand the characteristics of slow wave structures.

## Radar Systems

Course Outcome	Statement
C413.1	CO1. Derive the complete radar range equation.
C413.2	CO2. Understand the need and functioning of CW, FM-CW and MTI radars
C413.3	CO3. Known various Tracking methods.
C413.4	CO4. Derive the matched filter response characteristics for radar receivers.

## Electromagnetic Fields and Waves

Course Outcome	Statement
C221.1	CO1: Get the knowledge of Basic Laws, Concepts and proofs related to Electrostatic Fields and Magneto static Fields.
C221.2	CO2: Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.
C221.3	CO3: Analyze the Wave Equations for good conductors, good dielectrics and evaluate the UPW Characteristics for several practical media of interest.
C221.4	CO4: To analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems.

## VLSI Design

Course Outcome	Statement
C323.1	CO1.AcquirequalitativeknowledgeaboutthefabricationprocessofintegratedcircuitsusingMOStransistors.
C323.2	CO2.Drawthelayoutofanylogiccircuitwhichhelpstounderstandandestimateparasiticeffectofany logiccircuit.
C323.3	CO3.Designbuildingblocksofdatapathsystems,memoriesandsimplelogiccircuitsusingPLA,PAL,FPGAand CPLD.
C323.4	CO4.Understanddifferenttypesoffaultsthatcanoccur inasystemandlearntheconceptoftestingandadding extra hardwareto improvetestabilityofsystem.

## 19MBA16: PRODUCTION AND OPERATIONS MANAGEMENT

**Course Objective:** To understand the concepts of production and operations management in an organization and analytical methods.

**Learning Outcome:** Students will be able to understand

- Concepts of Operations management,
- Product & process design, analysis,
- Plant location and layout,
- Scheduling and Material Management.

## 19MBA18: DATA ANALYTICS

**CourseObjective:** To understand the importance of ever-increasing volume, variety and velocity of data in organization and application of data analytical tools for decision making.

**Learning Outcome:** Students will be able to understand

- Importance of Analytics
- Understanding the analytical tools
- Application of Analytical tools to solve business problems.

## **19MBA17: MANAGEMENT INFORMATION SYSTEM**

**Course Objective:** To understand the importance of information systems in organization for decision making.

**Learning Outcome:** Students will be able to understand

- a) Concepts & applications of Management Information Systems
- b) Information Systems Planning & Implementations
- c) Cyber crime and information security.

## **19MBA19M1: DIGITAL MARKETING**

**Course Objective:** The objective of this course is to understand the importance of digital marketing and its applications.

**Learning Outcome:** Students will understand

- the applications of digital marketing in the globalized market
- Channels of Digital Marketing
- digital marketing plan
- d) Search engine marketing
- Online Advertising

## **19MBA20M2: ADVERTISING AND SALES MANAGEMENT**

**Course Objective:** To understand Advertising, Sales Management and Sales Personnel, the role of Distribution Channels and enabling them to manage Channel Institutions.

**Learning outcome:** Student will be able to understand the importance of Sales Management, Sales Planning and Budgeting and need for distribution channels and managing them.

## **19MBA21M3: CONSUMER BEHAVIOR**

**Course Objective:** To understand marketing decisions keeping in mind the consumer behavior.

**Learning outcome:** Student should be able to

- understand consumer behavior
- environmental influences on consumer behavior,
- perception and attitude of consumers,

- consumer decision making
- Marketing ethics towards consumer.

### **19MBA19F1: SECURITY ANALYSIS PORTFOLIO MANAGEMENT**

**Course Objective:** To understand the investment process, investment alternatives, Valuation of debt and equity.

**Learning Outcome:** Students will be able to understand

- Indian Investment Environment
- Portfolio Analysis
- Bond valuation and management
- Equity valuation of Cash market and derivatives
- Performance evaluation of Portfolios.
- 

### **19MBA20F2: FINANCIAL INSTITUTIONS, MARKETS AND SERVICES**

**Course Objectives:** To give an understanding about Indian Financial system with respect to Markets, Institutions and Services.

**Learning Outcome:** Students will be able to understand

- Introduction to Indian Financial system
- Banking and Non-Banking Institutions
- Financial and Securities markets.
- Fund and Fee based

### **19MBA21F3: STRATEGIC MANAGEMENT ACCOUNTING**

**Course Objective:** To understand the components of product cost, their calculation methods, and their control.

**Learning Outcomes:** Students will be able to understand

- Fundamentals of Management accounting and Cost accounting
- Cost analysis
- Marginal costing
- Budget and Budgetary controls.
- 

### **19MBA19H1: PERFORMANCE MANAGEMENT SYSTEMS**

**Course Objective:** To understand about performance management and reward system and communicating to enhance employee performance.

**Learning Outcome:** Students will be able to understand

- Significance of Performance Management
- Communication of Performance Management
- Performance Management and Development of Employees
- Reward System,
- other performance related concepts.
- 

## **19MBA20H2: LEARNING AND DEVELOPMENT**

**Course Objective:** To understand the concept of Learning with emphasis on training and Development and its role in organizational Development.

**Learning Outcome:** Students will be able to understand

- the importance of Learning performance
- Training and Development
- Training Need Analysis
- Training Methods.

## **19MBA21H3: MANAGEMENT OF INDUSTRIAL RELATIONS**

**Course objective:** To understand of dynamics of Industrial Relations against the backdrop of monitoring and regulatory environment in India.

**Learning Outcome:** Students will be able to understand

- importance of Industrial Relations
- Collective Bargaining Mechanism
- Parties and role in Industrial Relations
- Labour Legislation aspects.

## **19MBA01: MANAGEMENT & ORGANIZATIONAL BEHAVIOR**

**Course Objective:** To understand the Fundamentals of Management and Behavioral aspects of individual and groups in an organization.

### **LEARNING OUTCOME:**

Students will be able to understand

- Evolution of Management and contribution of Management thinkers
- the relevance of environmental scanning, planning and to take decisions,
- Organizing and controlling
- Individual and group Behavior
- Leadership and Motivation.



### **19MBA02: BUSINESS ECONOMICS**

Course Objective: To understand the Business, impact of Micro and Macro Economic Environment on business decisions.

Learning Outcome: Students will be able to understand

- Economic Principles in Business
- Forecast Demand and Supply
- Production and Cost Estimates
- Market Structure and Pricing Practices
- Economic policies.

### **19MBA03: FINANCIAL ACCOUNTING AND ANALYSIS**

Course Objective: To prepare, analyze, interpret the financial statements for business decision making.

Learning Outcome: Students will be able to understand

- Principles of Accounting, Accounting Process
- Inventory Valuation
- Preparation, Analysis and Interpretation of Financial Statements.

### **19MBA04: RESEARCH METHODOLOGY AND STATISTICAL ANALYSIS**

Course Objective: To understand the basic statistical tools for analysis & interpretation of qualitative & quantitative data.

Learning outcome: Students will be able to understand

- Conceptual overview of Research
- To apply, analyze various simple & advanced statistical tools
- To apply the principles of research methodology for various projects.

**19MBA06C: TECHNOLOGY MANAGEMENT (OPEN ELECTIVE – I)**

Course Objective: To understand the importance of technology in conduct of business.

Learning Outcome: Student will be able to understand:

- Importance of Technological Innovation
- Importance of Research and development in technology management
- Forecasting of Technology

**19MBA07 BUSINESS COMMUNICATIONS (LAB)**

Course Objective: To understand the importance of oral and written communication and its applications in Business.

Learning Outcome: Students will be able to understand

- the importance of Communication in Business
- to develop writing skills and presentation
- writing business proposals and letters
- Application of business communication in the self-development process.

**19MBA08: STATISTICAL DATA ANALYSIS LAB**

Course Objective: To understand the application of Statistical tools to Research Problem / Projects.

Learning Outcome: Students will be able to understand

- Analyse and apply the statistical tools for decision making
- Hypotheses Testing
- Discussion of Results for better decision making.
- .

**Course Outcomes (COs): B. Tech I year I & II semesters: CSE/IT/EEE, JNTUH-R18 Regulation**

Code	Course Name	Course Outcomes
<b>I B. Tech I Semester</b>		
MA101BS	Mathematics - I	<p>CO1. Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations.</p> <p>CO2. Find the Eigen values and Eigen vectors.</p> <p>CO3. Reduce the quadratic form to canonical form using orthogonal transformations.</p> <p>CO4. Analyze the nature of sequence and series.</p> <p>CO5. Solve the applications on the mean value theorems.</p>
CH102BS	Chemistry	<p>CO1. The knowledge of atomic, molecular and electronic changes, band theory related to conductivity</p> <p>CO2. The required knowledge about importance of water and understanding its treatments methods.</p> <p>CO3. The required principles and concepts of electrochemistry, corrosion.</p> <p>CO4. The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.</p> <p>CO5. The knowledge of configurationally and conformational analysis of molecules and reaction mechanisms.</p>
EE103ES	Basic Electrical Engineering	<p>CO1. To analyze and solve electrical circuits using network laws and theorem</p> <p>CO2. To understand and analyze basic Electric and Magnetic circuits</p> <p>CO3. To study the working principles of Electrical Machines</p> <p>CO4. To introduce various switches &amp; batteries</p>
ME105ES	Engineering Workshop	<p>CO1. Study and practice on machine tools and their operations</p> <p>CO2. Practice on manufacturing of components using workshop Trades including plumbing, fitting, carpentry, foundry, house wiring and welding.</p> <p>CO3. Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.</p> <p>CO4. Apply basic electrical engineering knowledge for house wiring practice.</p>
EN105HS	English	<p>CO1. Use English Language effectively in spoken and written forms.</p> <p>CO2. Comprehend the given texts and respond appropriately.</p> <p>CO3. Communicate confidently in various contexts and different cultures.</p> <p>CO4. Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.</p>

CH106BS	Engineering Chemistry Lab	<p>CO1. Determination of parameters like hardness and chloride content in water.</p> <p>CO2. Estimation of rate constant of a reaction from concentration – Time relationships.</p> <p>CO3. Determination of physical properties like adsorption and viscosity.</p> <p>CO4. Calculation of RF values of some organic molecules by TLC technique.</p>
EN107HS	English Language and Communication skills Lab	<p>CO1. Better understanding of nuances of English language through audio-visual experience and group activities</p> <p>CO2. Neutralization of accent for intelligibility</p> <p>CO3. Speaking skills with clarity and confidence which in turn enhances their employability skills</p>
EE108ES	Basic Electrical Engineering Lab	<p>CO1. Get an exposure to basic electrical laws.</p> <p>CO2. Understand the response of different types of electrical circuits to different excitations.</p> <p>CO3. Understand the measurement, calculation and relation between the basic electrical parameters</p> <p>CO4. Understand the basic characteristics of transformers and electrical machines.</p>

Code	Course Name	Course Outcomes
<b>I B. Tech II Semester</b>		
MA201BS	Mathematics – II	<p>CO1. Identify whether the given differential equation of first order is exact or not.</p> <p>CO2. Solve higher differential equation and apply the concept of differential equation to real world problems.</p> <p>CO3. Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelepiped</p> <p>CO4. Evaluate the line, surface and volume integrals and converting them from one to another.</p> <p>CO5. Apply Gauss, Greens and Stokes theorems</p>
AP202BS	Applied Physics	<p>CO1. The student would be able to learn the fundamental concepts on Quantum behavior of matter in its micro state.</p> <p>CO2. The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fiber optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.</p> <p>CO3. Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.</p> <p>CO4. The course also helps the students to be exposed to the Phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.</p>

CS203ES	Programming for Problem Solving	CO1. To write algorithms and to draw flowcharts for solving problems. CO2. To convert the algorithms/flowcharts to C programs. CO3. To code and test a given logic in C programming language. CO4. To decompose a problem into functions and to develop modular reusable code. CO5. To use arrays, pointers, strings and structures to write C programs. CO6. Searching and sorting problems.
ME204ES	Engineering Graphics	CO1.Preparing working drawings to communicate the ideas and information. CO2.Read, understand and interpret engineering drawings
AP205BS	Applied Physics Lab	CO1. Examine the usage of different components and build the electrical circuits. CO2. Compare the theory and co-relate with experiment. CO3. Understand the applications of physics experiments in day – To – day life.
CS206ES	Programming for Problem Solving Lab	CO1. formulate the algorithms for simple problems CO2. Translate given algorithms to a working and correct program CO3. correct syntax errors as reported by the compilers CO4. identify and correct logical errors encountered during execution CO5. represent and manipulate data with arrays, strings and structures CO6. use pointers of different types CO7. Create, read and write to and from simple text and binary files CO8. modularize the code with functions so that they can be reused
*MC209 ES	Environmental Science	CO1. Determine the Natural resources on which the structure of development is raised for sustainability of the society through equitable maintenance of natural resources. CO2. Illustrate about biodiversity that raises an appreciation and deeper understanding of species, ecosystems and also the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity. CO3. Summarize a methodology for identification, assessment and quantification of global environmental issues in order to create awareness about the international conventions for mitigating global environmental problems CO4. Sustainable development that aims to meet raising human needs of the present and future generations through preserving the environment CO5. Outline green environmental issue provides an opportunity to overcome the current global environmental issues by implementing modern techniques like CDM, green building, green computing etc. CO6. Global environmental issues in order to create awareness

**Course Outcomes (COs): B. Tech I year I & II semesters: ECE, INTUJ-R18 Regulation**

Code	Course Name	Course Outcomes
<b>I B. Tech I Semester</b>		
MA101BS	Mathematics - I	<p>CO1. Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations.</p> <p>CO2. Find the Eigen values and Eigen vectors.</p> <p>CO3. Reduce the quadratic form to canonical form using orthogonal transformations.</p> <p>CO4. Analyze the nature of sequence and series.</p> <p>CO5. Solve the applications on the mean value theorems.</p>
AP102BS	Applied Physics	<p>CO1. The student would be able to learn the fundamental concepts on Quantum behavior of matter in its micro state.</p> <p>CO2. The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fiber optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.</p> <p>CO3. Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.</p> <p>CO4. The course also helps the students to be exposed to the Phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.</p>
CS103ES	Programming for Problem Solving	<p>CO1. To write algorithms and to draw flowcharts for solving problems.</p> <p>CO2. To convert the algorithms/flowcharts to C programs.</p> <p>CO3. To code and test a given logic in C programming language.</p> <p>CO4. To decompose a problem into functions and to develop modular reusable code.</p> <p>CO5. To use arrays, pointers, strings and structures to write C programs.</p> <p>CO6. Searching and sorting problems.</p>
ME104ES	Engineering Graphics	<p>CO1. Preparing working drawings to communicate the ideas and information.</p> <p>CO2. Read, understand and interpret engineering drawings</p>
AP105BS	Applied Physics Lab	<p>CO1. Examine the usage of different components and build the electrical circuits.</p> <p>CO2. Compare the theory and co-relate with experiment.</p> <p>CO3. Understand the applications of physics experiments in day – To – day life.</p>
CS106ES	Programming for Problem Solving Lab	<p>CO1. formulate the algorithms for simple problems</p> <p>CO2. Translate given algorithms to a working and correct program</p> <p>CO3. correct syntax errors as reported by the compilers</p> <p>CO4. identify and correct logical errors encountered during execution</p> <p>CO5. represent and manipulate data with arrays, strings and structures</p> <p>CO6. use pointers of different types</p> <p>CO7. Create, read and write to and from simple text and binary files</p> <p>CO8. modularize the code with functions so that they can be reused</p>

*MC109 ES	Environmental Science	<p>CO1. Determine the Natural resources on which the structure of development is raised for sustainability of the society through equitable maintenance of natural resources.</p> <p>CO2. Illustrate about biodiversity that raises an appreciation and deeper understanding of species, ecosystems and also the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity.</p> <p>CO3. Summarize a methodology for identification, assessment and quantification of global environmental issues in order to create awareness about the international conventions for mitigating global environmental problems</p> <p>CO4. Sustainable development that aims to meet raising human needs of the present and future generations through preserving the environment</p> <p>CO5. Outline green environmental issue provides an opportunity to overcome the current global environmental issues by implementing modern techniques like CDM, green building, green computing etc.</p> <p>CO6. Global environmental issues in order to create awareness</p>
--------------	--------------------------	---

Code	Course Name	Course Outcomes
<b>I B. Tech II Semester</b>		
MA201BS	Mathematics – II	<p>CO1. Identify whether the given differential equation of first order is exact or not.</p> <p>CO2. Solve higher differential equation and apply the concept of differential equation to real world problems.</p> <p>CO3. Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelepiped</p> <p>CO4. Evaluate the line, surface and volume integrals and converting them from one to another.</p> <p>CO5. Apply Gauss, Greens and Stokes theorems</p>
CH202BS	Chemistry	<p>CO1. The knowledge of atomic, molecular and electronic changes, band theory related to conductivity</p> <p>CO2. The required knowledge about importance of water and understanding its treatments methods.</p> <p>CO3. The required principles and concepts of electrochemistry, corrosion.</p> <p>CO4. The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.</p> <p>CO5. The knowledge of configurationally and conformational analysis of molecules and reaction mechanisms.</p>
EE203ES	Basic Electrical Engineering	<p>CO1. To analyze and solve electrical circuits using network laws and theorem</p> <p>CO2. To understand and analyze basic Electric and Magnetic circuits</p> <p>CO3. To study the working principles of Electrical Machines</p> <p>CO4. To introduce various switches &amp; batteries</p>

ME205ES	Engineering Workshop	CO1. Study and practice on machine tools and their operations CO2. Practice on manufacturing of components using workshop Trades including plumbing, fitting, carpentry, foundry, house wiring and welding. CO3. Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling. CO4. Apply basic electrical engineering knowledge for house wiring practice.
EN205HS	English	CO1. Use English Language effectively in spoken and written forms. CO2. Comprehend the given texts and respond appropriately. CO3. Communicate confidently in various contexts and different cultures. CO4. Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.
CH206BS	Engineering Chemistry Lab	CO1. Determination of parameters like hardness and chloride content in water. CO2. Estimation of rate constant of a reaction from concentration – Time relationships. CO3. Determination of physical properties like adsorption and viscosity. CO4. Calculation of RF values of some organic molecules by TLC technique.
EN207HS	English Language and Communication skills Lab	CO1. Better understanding of nuances of English language through audio-visual experience and group activities CO2. Neutralization of accent for intelligibility CO3. Speaking skills with clarity and confidence which in turn enhances their employability skills
EE208ES	Basic Electrical Engineering Lab	CO1. Get an exposure to basic electrical laws. CO2. Understand the response of different types of electrical circuits to different excitations. CO3. Understand the measurement, calculation and relation between the basic electrical parameters CO4. Understand the basic characteristics of transformers and electrical machines.

**Course Outcomes (COs): B. Tech I year I & II semesters: MECH & CIVIL, INTUH-R18 Regulation**

Code	Course Name	Course Outcomes
<b>I B. Tech I Semester</b>		



MA101BS	Mathematics - I	<p>CO1. Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations.</p> <p>CO2. Find the Eigen values and Eigen vectors.</p> <p>CO3.Reduce the quadratic form to canonical form using orthogonal transformations.</p> <p>CO4. Analyze the nature of sequence and series.</p> <p>CO5. Solve the applications on the mean value theorems.</p>
AP102BS	Applied Physics	<p>CO1. The student would be able to learn the fundamental concepts on Quantum behavior of matter in its micro state.</p> <p>CO2. The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fiber optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.</p> <p>CO3. Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.</p> <p>CO4. The course also helps the students to be exposed to the Phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.</p>
CS103ES	Programming for Problem Solving	<p>CO1. To write algorithms and to draw flowcharts for solving problems.</p> <p>CO2. To convert the algorithms/flowcharts to C programs.</p> <p>CO3. To code and test a given logic in C programming language.</p> <p>CO4. To decompose a problem into functions and to develop modular reusable code.</p> <p>CO5. To use arrays, pointers, strings and structures to write C programs.</p> <p>CO6. Searching and sorting problems.</p>
ME104ES	Engineering Graphics	<p>CO1.Preparing working drawings to communicate the ideas and information.</p> <p>CO2.Read, understand and interpret engineering drawings</p>
AP105BS	Applied Physics Lab	<p>CO1. Examine the usage of different components and build the electrical circuits.</p> <p>CO2. Compare the theory and co-relate with experiment.</p> <p>CO3. Understand the applications of physics experiments in day – To – day life.</p>
CS106ES	Programming for Problem Solving Lab	<p>CO1. formulate the algorithms for simple problems</p> <p>CO2. Translate given algorithms to a working and correct program CO3. correct syntax errors as reported by the compilers</p> <p>CO4. identify and correct logical errors encountered during execution</p> <p>CO5. represent and manipulate data with arrays, strings and structures</p> <p>CO6. use pointers of different types</p> <p>CO7. Create, read and write to and from simple text and binary files CO8. modularize the code with functions so that they can be reused</p>

*MC109 ES	Environmental Science	<p>CO1. Determine the Natural resources on which the structure of development is raised for sustainability of the society through equitable maintenance of natural resources.</p> <p>CO2. Illustrate about biodiversity that raises an appreciation and deeper understanding of species, ecosystems and also the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity.</p> <p>CO3. Summarize a methodology for identification, assessment and quantification of global environmental issues in order to create awareness about the international conventions for mitigating global environmental problems</p> <p>CO4. Sustainable development that aims to meet raising human needs of the present and future generations through preserving the environment</p> <p>CO5. Outline green environmental issue provides an opportunity to overcome the current global environmental issues by implementing modern techniques like CDM, green building, green computing etc.</p> <p>CO6. Global environmental issues in order to create awareness</p>
--------------	--------------------------	---

Code	Course Name	Course Outcomes
<b>I B. Tech II Semester</b>		
MA201BS	Mathematics – II	<p>CO1. Identify whether the given differential equation of first order is exact or not.</p> <p>CO2. Solve higher differential equation and apply the concept of differential equation to real world problems.</p> <p>CO3. Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelepiped</p> <p>CO4. Evaluate the line, surface and volume integrals and converting them from one to another.</p> <p>CO5. Apply Gauss, Greens and Stokes theorems</p>
CH202BS	Chemistry	<p>CO1. The knowledge of atomic, molecular and electronic changes, band theory related to conductivity</p> <p>CO2. The required knowledge about importance of water and understanding its treatments methods.</p> <p>CO3. The required principles and concepts of electrochemistry, corrosion.</p> <p>CO4. The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.</p> <p>CO5. The knowledge of configurationally and conformational analysis of molecules and reaction mechanisms.</p>
ME203ES	Engineering Mechanics	<p>CO1. Determine resultant of forces acting on a body and analyse equilibrium of a body subjected to a system of forces.</p> <p>CO2. Solve problem of bodies subjected to friction</p> <p>CO3. Find the location of centroid and calculate moment of inertia of a given section.</p> <p>CO4. Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.</p>

		CO5. Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration.
ME205ES	Engineering Workshop	CO1. Study and practice on machine tools and their operations CO2. Practice on manufacturing of components using workshop Trades including plumbing, fitting, carpentry, foundry, house wiring and welding. CO3. Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling. CO4. Apply basic electrical engineering knowledge for house wiring practice.
EN205HS	English	CO1. Use English Language effectively in spoken and written forms. CO2. Comprehend the given texts and respond appropriately. CO3. Communicate confidently in various contexts and different cultures. CO4. Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.
CH206BS	Engineering Chemistry Lab	CO1. Determination of parameters like hardness and chloride content in water. CO2. Estimation of rate constant of a reaction from concentration – Time relationships. CO3. Determination of physical properties like adsorption and viscosity. CO4. Calculation of RF values of some organic molecules by TLC technique.
EN207HS	English Language and Communication skills Lab	CO1. Better understanding of nuances of English language through audio-visual experience and group activities CO2. Neutralization of accent for intelligibility CO3. Speaking skills with clarity and confidence which in turn enhances their employability skills

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**ANALOG AND DIGITAL ELECTRONICS**


**B.TECH II Year I Sem.**

**Course Objectives**

- To introduce components such as diodes, BJT's and FET's.
- To know the applications of components.
- To give understanding of various types of amplifier circuits
- To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
- To understand the concepts of combinational logic circuits and sequential circuits.

**Course Outcomes**

- Upon completion of the Course, the students will be able to Know the characteristics of various components.
- Understand the utilization of components.
- Design and analyze small signal amplifier circuits.
- Learn Postulates of Boolean algebra and to minimize combinational functions  
Design and analyze combinational and sequential circuits.
- Know about the logic families and realization of logic gates.

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pitlagur (V), Chittoor District (Dist),  
Abulnashim (M), R.R. Dist. HYD-501 812.

DATA STRUCTURES


B.TECH II Year I Sem

Course Objectives

- Exploring basic data structures such as stacks and queues.
- Introduces a variety of data structures such as hash tables, search trees, tries, heaps, graphs.
- Introduces sorting and pattern matching algorithms

Course Outcomes

- Ability to select the data structures that efficiently model the information in a problem.
- Ability to assess efficiency trade-offs among different data structure implementations or combinations.
- Implement and know the application of algorithms for sorting and pattern matching.
- Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pigipier (V), East Godavari District  
Abdullapuram (M), R.R. Dist. 172-601

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**COMPUTER ORIENTED STATISTICAL METHODS**

**B.TECH II Year I Sem**

**Course Objectives**

- To learn the theory of Probability, and probability distributions of single and multiple random variables
- The sampling theory and testing of hypothesis and making inferences
- Stochastic process and Markov chains.

**Course Outcomes**

- After learning the contents of this paper the student must be able to apply the concepts of probability and distributions to some case studies correlate the material of one unit to the material in other units
- Resolve the potential misconceptions and hazards in each topic of study.

**PRINCIPAL**

Annamacharya Institute of  
Technology & Sciences  
Piglipur (V), Botasigaram (Post),  
Abdulapurmet (TA), R.R.Dist.NYD-531 512.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**COMPUTER ORGANIZATION AND ARCHITECTURE**

**B.TECH II Year I Sem**


**Course Objectives:**

- The purpose of the course is to introduce principles of computer organization and the basic architectural concepts.
- It begins with basic organization, design, and programming of a simple digital computer and introduces simple register transfer language to specify various computer operations.
- Topics include computer arithmetic, instruction set design, microprogrammed control unit, pipelining and vector processing, memory organization and I/O systems, and multiprocessors

**Course Outcomes:**

- Understand the basics of instructions sets and their impact on processor design.
- Demonstrate an understanding of the design of the functional units of a digital computer system.
- Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
- Design a pipeline for consistent execution of instructions with minimum hazards.
- Recognize and manipulate representations of numbers stored in digital computers

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Foghour (V), Guntur (Dist) (Andhra Pradesh)  
Abdulapurna (M), H.A. Bhat, N.Y.D. of St.2.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**OBJECT ORIENTED PROGRAMMING USING C++**

**B.TECH II Year I Sem**

**Course Objectives**

- Introduces Object Oriented Programming concepts using the C++ language.
- Introduces the principles of data abstraction, inheritance and polymorphism;
- Introduces the principles of virtual functions and polymorphism
- Introduces handling formatted I/O and unformatted I/O  
Introduces exception handling

**Course Outcomes**

- Handle exceptions in programming
- Develop applications for a range of problems using object-oriented programming techniques

---

  
Annamacharya Institute of Technology & Sciences  
Prof. Dr. V. Ramesh Babu  
116, Jammalamasani, Nellore District, Andhra Pradesh, India

---



**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**ANALOG AND DIGITAL ELECTRONICS LAB**

**B.Tech. II Year I Sem.**


**Course Objectives:**

- To introduce components such as diodes, BJT's and FET's.
- To know the applications of components.
- To give understanding of various types of amplifier circuits.
- To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
- To understand the concepts of combinational logic circuits and sequential circuits.

**Course Outcomes:**

- Know the characteristics of various components.
- Understand the utilization of components.
- Design and analyze small signal amplifier circuits.
- Postulates of Boolean algebra and to minimize combinational functions Design and analyze combinational and sequential circuits
- Known about the logic families and realization of logic gates.

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pigalur (V), Balasranganah (Post),  
Abdollopuriel (M), R.R.Stat.11 (D-GR) 512.

---

**DATA STRUCTURES LAB**

**B.Tech. II Year I Sem**

**Course Objectives:**

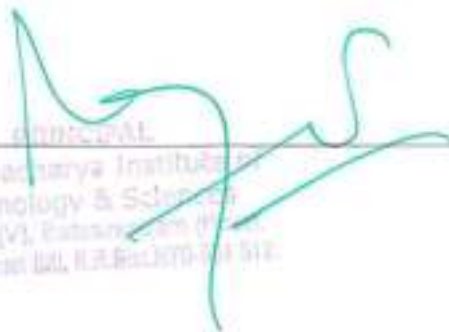
- It covers various concepts of C programming language
- It introduces searching and sorting algorithms
- It provides an understanding of data structures such as stacks and queues.

**Course Outcomes:**

- Ability to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.
- Ability to Implement searching and sorting algorithms

---

Annamacharya Institute of  
Technology & Sciences  
Pigapala (V), East Godavari District  
Addalapuram (M), R.R. East Godavari Dist.



**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**C++ PROGRAMMING LAB**

**B.Tech. II Year I Sem**

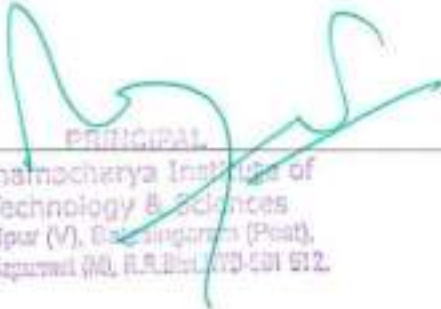
**Course Objectives**

- Introduces object-oriented programming concepts using the C++ language.
- Introduces the principles of data abstraction, inheritance and polymorphism.
- Introduces the principles of virtual functions and polymorphism
- Introduces handling formatted I/O and unformatted I/O
- Introduces exception handling

**Course Outcomes**

- Ability to develop applications for a range of problems using object-oriented programming techniques

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Duvvur (Post),  
Abdullapuram (M), H.R. Dist. 523-001 012.

---

**.DISCRETE MATHEMATICS**

**B.TECH II Year II Sem**

**Course Objectives**

- Introduces the elementary discrete mathematics for computer science and engineering.
- Topics include formal logic notation, methods of proof, induction, sets, relations, graph theory, permutations and combinations, counting principles; recurrence relations and generating functions.

**Course Outcomes**

- Ability to understand and construct precise mathematical proofs
- Ability to use logic and set theory to formulate precise statements
- Ability to analyze and solve counting problems on finite and discrete structures  
ability to describe and manipulate sequences
- Ability to apply graph theory in solving computing problems

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pulipur (V), Bataasingeram (Taluk),  
Abdolegumet (M), R.R. Dist. (YD) 512.

---

**OPERATING SYSTEMS**

**B.TECH II Year II Sem.**

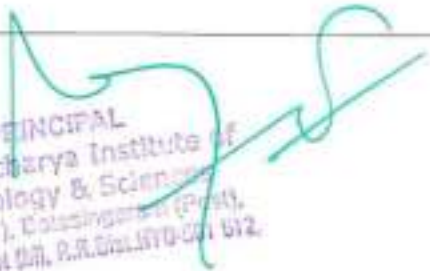
**Course Objectives:**

- Provide an introduction to operating system concepts (i.e., processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection)
- Introduce the issues to be considered in the design and development of operating system.
- Introduce basic Unix commands, system call interface for process management, interprocess communication and I/O in Unix

**Course Outcomes:**

- Demonstrate the knowledge of the components of computer and their respective roles in computing.
- Ability to recognize and resolve user problems with standard operating environments.
- Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pigalpur (V), Colacsingam (Prest),  
Abdullapuram (M), P.O. Dist. HYD-07 512.

---

**DATABASE MANAGEMENT SYSTEMS**

**B.TECH II Year II Sem**

**Course Objectives**

- To understand the basic concepts and the applications of database systems.
- To master the basics of SQL and construct queries using SQL.
- Topics include data models, database design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.

**Course Outcomes:**

- Gain knowledge of fundamentals of DBMS, database design and normal forms master the basics of SQL for retrieval and management of data.
- Be acquainted with the basics of transaction processing and concurrency control. Familiarity with database storage structures and access techniques

---

**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Rajamahendravaram (Post),  
Abdulrajahmet (R), S.R.Nellore (D-501 612).

---

**JAVA PROGRAMMING**

**B.TECH II Year II Sem**

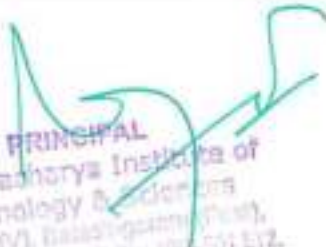
**Course Objectives**

- To introduce the object oriented programming concepts.
- To understand object oriented programming concepts, and apply them in solving problems.
- To introduce the principles of inheritance and polymorphism; and demonstrate how they relate to the design of abstract classes
- To introduce the implementation of packages and interfaces
- To introduce the concepts of exception handling and multithreading.
- To introduce the design of Graphical User Interface using applets and swing controls.

**Course Outcomes**

- Able to solve real world problems using OOP techniques.
- Able to understand the use of abstract classes.
- Able to solve problems using java collection framework and I/o classes.
- Able to develop multithreaded applications with synchronization.
- Able to develop applets for web applications.
- Able to design GUI based applications

---

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pulicheri (V), Nellore District, Andhra Pradesh  
Address: Tel. No. 0864-2511770-01 to 012.

---

**OPERATING SYSTEMS LAB**

**B.TECH II Year II Sem**

**Course Objectives:**

- To provide an understanding of the design aspects of operating system concepts through simulation
- Introduce basic Unix commands, system call interface for process management, interprocess communication and I/O in Unix

**Course Outcomes:**

- Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.
- Able to implement C programs using Unix system calls

---

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Srisaiguda (Post),  
Addalapuram (M), R.R. 2nd Line-501 512.

---



**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**DATABASE MANAGEMENT SYSTEMS LAB**

**B.TECH II Year II Sem.**


**Course Objectives:**

- Introduce ER data model, database design and normalization
- Learn SQL basics for data definition and data manipulation

**Course Outcomes:**

- Design database schema for a given application and apply normalization
- Acquire skills in using SQL commands for data definition and data manipulation.
- Develop solutions for database applications using procedures, cursors and triggers

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pigilur (V), Esteroor (Post),  
Abdullaypettai Rd, R.A.D.Col. 525 021 SIZ.

---

JAVA PROGRAMMING LAB

B.TECH II Year II Sem


Course Objectives

- To write programs using abstract classes.
- To write programs for solving real world problems using java collection frame work.
- To write multithreaded programs.
- To write GUI programs using swing controls in Java.
- To introduce java compiler and eclipse platform.
- To impart hands on experience with java programming.

Course Outcomes

- Able to write programs for solving real world problems using java collection frame work.
- Able to write programs using abstract classes.
- Able to write multithreaded programs.
- Able to write GUI programs using swing controls in Java.

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pigloor (V), Duvvur (P),  
Addispettai 52, N.R.24, NG-101 512.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**DESIGN AND ANALYSIS OF ALGORITHMS**

**B.Tech. III Year I Sem.**

**Course Code: CS501PC**

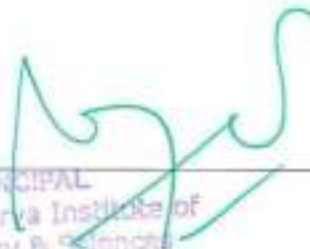
**Course Objectives**

- To analyze performance of algorithms.
- To choose the appropriate data structure and algorithm design method for a specified application.
- To understand how the choice of data structures and algorithm design methods impacts the performance of programs.
- To solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound.
- To understand the differences between tractable and intractable problems.
- To introduce P and NP classes.

**Course Outcomes:**

- Ability to analyze the performance of algorithms.
- Ability to choose appropriate algorithm design techniques for solving problems.
- Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs.

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Science  
Pulijur (V), Bhusilipatnam (Post),  
Addisapet 502, R.R. Dist. AP-501 512.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**DATA COMMUNICATION AND COMPUTER NETWORKS**

**B.Tech. III Year I Sem.**

**Course Code: CS502PC**


**Course Objectives:**

- To introduce the fundamental various types of computer networks.
- To demonstrate the TCP/IP and OSI models with merits and demerits.
- To explore the various layers of OSI Model.
- To introduce UDP and TCP Models.

**Course Outcomes:**

- Students should be understand and explore the basics of Computer Networks and Various Protocols. He/She will be in a position to understand the World Wide Web concepts.
- Students will be in a position to administrate a network and flow of information further he/she can understand easily the concepts of network security, Mobile and adhoc networks.

---

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Dattamangalam (Post),  
Atmakurthi Dist, R.R. Dist.HQ. 501 512.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**SOFTWARE ENGINEERING**

**B.Tech. III Year I Sem.**

**Course Code: CS503PC**


**Course Objectives:**

- To understanding of software process models such as waterfall and evolutionary models.
- To understanding of software requirements and SRS document.
- To understanding of different software architectural styles.
- To understanding of software testing approaches such as unit testing and integration testing.
- To understanding on quality control and how to ensure good quality software.

**Course Outcomes:**

- Ability to identify the minimum requirements for the development of application.
- Ability to develop, maintain, efficient, reliable and cost effective software solutions
- Ability to critically thinking and evaluate assumptions and arguments.

---

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Baleswaram (Dist),  
Abdullapuram (M), R.R. Dist. (V) - 521 512.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**FUNDAMENTALS OF MANAGEMENT**

**B.Tech. III Year I Sem.**

**Course Code: SM504MS**

**Course Objective:**

To understand the Management Concepts, applications of Concepts in Practical aspects of business and development of Managerial Skills.

**Course Outcome:**

- The students understand the significance of Management in their Profession.
- The various Management Functions like Planning, Organizing, Staffing, Leading, Motivation and Control aspects are learnt in this course.
- The students can explore the Management Practices in their domain area.

---

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Piglipur (V), Baddanagara (Post),  
Abdullapuram Dist. T.N. Dist. W.D-501 512.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**DESIGN AND ANALYSIS OF ALGORITHMS LAB**

**B.Tech. III Year I Sem.**

**Course Code: CS505PC**

**Course Objectives:**

- To write programs in java to solve problems using divide and conquer strategy.
- To write programs in java to solve problems using backtracking strategy.
- To write programs in java to solve problems using greedy and dynamic programming techniques.

**Course Outcomes:**

Ability to write programs in java to solve problems using algorithm design techniques such as Divide and Conquer, Greedy, Dynamic programming, and Backtracking.

---

  
Principal  
Annamacharya Institute of  
Technology & Sciences  
Pulipati (O), Eastangaram (Post),  
Abdullaganpet (M), Nellore district, Andhra Pradesh

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**COMPUTER NETWORKS LAB**

**B.Tech. III Year I Sem.**

**Course Code: CS506PC**


**Course Objectives:**

- To Understand the functionalities of various layers of OSI model
- To understand the operating System functionalities

**Course Outcomes:**

- Ability to understand the encryption and decryption concepts in Linux environment
- Ability to apply appropriate algorithm for the finding of shortest route.
- Ability to configure the routing table

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pulipati (V), Bapatlagudem (Post),  
Abdulhamid (M), A.R. Road, JYD-5H 512.

---



**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**SOFTWARE ENGINEERING LAB**

**B.Tech. III Year I Sem.**

**Course Code: CS507PC**

**Course Objectives:**

- To understand the software engineering methodologies involved in the phases for project development.
- To gain knowledge about open source tools used for implementing software engineering methods.
- To exercise developing product-startups implementing software engineering methods.
- Open source Tools: StarUML / UMLGraph / Topcased

---

**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pitlagur (V), Ramana Puram (Post),  
Anandapuram 50, P.R. Kadapa Dist.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**COMPILER DESIGN**

**B.Tech. III Year II Sem.**

**Course Code: CS601PC**

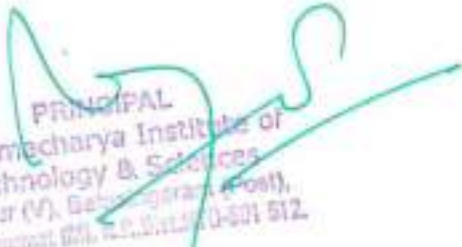
**Course Objectives:**

- To understand the various phases in the design of a compiler.
- To understand the design of top-down and bottom-up parsers.
- To understand syntax directed translation schemes.
- To introduce lex and yacc tools.
- To learn to develop algorithms to generate code for a target machine.

**Course Outcomes:**

- Ability to design, develop, and implement a compiler for any language.
- Able to use lex and yacc tools for developing a scanner and a parser.
- Able to design and implement LL and LR parsers.
- Able to design algorithms to perform code optimization in order to improve the performance of a program in terms of space and time complexity.
- Ability to design algorithms to generate machine code

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Guntur District (Post),  
Andhra Pradesh, India. Ph: 0863-251512.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**WEB TECHNOLOGIES**

**B.Tech. III Year II Sem.**

**Course Code: CS602PC**

**Course Objectives:**

- To introduce PHP language for server side scripting
- To introduce XML and processing of XML Data with Java
- To introduce Server side programming with Java Servlets and JSP
- To introduce Client side scripting with Javascript and AJAX.

**Course Outcomes:**

- Gain knowledge of client side scripting, validation of forms and AJAX programming
- Have understanding of server side scripting with PHP language
- Have understanding of what is XML and how to parse and use XML Data with Java
- To introduce Server side programming with Java Servlets and JSP

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Piplurva, Hindupur, Andhra Pradesh  
Abhyudaya Hills, A.R. Nagar, Hindupur, Andhra Pradesh

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**CRYPTOGRAPHY AND NETWORK SECURITY**

**B.Tech. III Year II Sem.**

**Course Code: CS603PC**


**Course Objectives:**

- Explain the objectives of information security
- Explain the importance and application of each of confidentiality, integrity, authentication and availability
- Understand various cryptographic algorithms.
- Understand the basic categories of threats to computers and networks
- Describe public-key cryptosystem.
- Describe the enhancements made to IPv4 by IPsec
- Understand Intrusions and intrusion detection
- Discuss the fundamental ideas of public-key cryptography.
- Generate and distribute a PGP key pair and use the PGP package to send an encrypted e-mail message.
- Discuss Web security and Firewalls

**Course Outcomes:**

- Student will be able to understand basic cryptographic algorithms, message and web authentication and security issues.
- Ability to identify information system requirements for both of them such as client and server.
- Ability to understand the current legal issues towards information security.

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pulicheri (V), Sivasubramanian (Post),  
Abichandrapuram DAL, R.S. Dist., TN-605 012.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**MOBILE COMPUTING**  
**(PROFESSIONAL ELECTIVE - I)**

**B.Tech. III Year II Sem.**

**Course Code: CS611PE**

**Course Objectives:**

- To make the student understand the concept of mobile computing paradigm, its novel applications and limitations.
- To understand the typical mobile networking infrastructure through a popular GSM protocol
- To understand the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer
- To understand the database issues in mobile environments & data delivery models.
- To understand the ad hoc networks and related concepts.
- To understand the platforms and protocols used in mobile environment.

**Course Outcomes:**

- Able to think and develop new mobile application.
- Able to take any new technical issue related to this new paradigm and come up with a solution(s).
- Able to develop new ad hoc network applications and/or algorithms/protocols.
- Able to understand & develop any existing or new protocol related to mobile Environment

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Figlipur (V), Rajamahendravaram (Post),  
Abdulaparthi Dist, R.R.Sistla, D-501 512.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**DESIGN PATTERNS**  
**(PROFESSIONAL ELECTIVE - I)**

**B.Tech. III Year II Sem.**

**Course Code: CS612PE**

**Prerequisites**

1. A Course on Software Engineering"
2. A Course on "Object Oriented Programming Through Java"


**Course Objectives:**

- The aim of the course is to appreciate the idea behind Design Patterns in handling common problems faced during building an application
- This course covers all pattern types from creational to structural, behavioral to concurrency and highlights the scenarios when one pattern must be chosen over others.

**Course Outcomes:**

- Create software designs that are scalable and easily maintainable
- Understand the best use of Object Oriented concepts for creating truly OOP programs
- Use creational design patterns in software design for class instantiation
- Use structural design patterns for better class and object composition
- Use behavioral patterns for better organization and communication between the objects
- Use refactoring to compose the methods for proper code packaging
- Use refactoring to better organize the class responsibilities of current code

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Piplipur (V), East Godavari (Dist),  
Andhra Pradesh 522 202, A.P. India. 91-93-801 512.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**ARTIFICIAL INTELLIGENCE**  
**(Professional Elective - I)**

**B.Tech. III Year II Sem.**

**Course Code: CS613PE**

**Course Objectives:**

- To learn the difference between optimal reasoning vs human like reasoning
- To understand the notions of state space representation, exhaustive search, heuristic search along with the time and space complexities
- To learn different knowledge representation techniques
- To understand the applications of AI: namely Game Playing, Theorem Proving,
- Expert Systems, Machine Learning and Natural Language Processing

**Course Outcomes:**

- Possess the ability to formulate an efficient problem space for a problem expressed in English.
- Possess the ability to select a search algorithm for a problem and characterize its time and space complexities.
- Possess the skill for representing knowledge using the appropriate technique
- Possess the ability to apply AI techniques to solve problems of Game Playing, Expert Systems, Machine Learning and Natural Language Processing

---

  
**PRINCIPAL**

Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Srisailam (Dist)  
Andhra Pradesh, India. 508102

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**


**INFORMATION SECURITY MANAGEMENT (SECURITY ANALYST-I)**  
**(PROFESSIONAL ELECTIVE - I)**

**B.Tech. III Year II Sem.**

**Course Code: CS614PE**

**Course Objectives:**

- To introduce the terminology, technology and its applications
- To introduce the concept of Security Analyst
- To introduce the tools, technologies & programming languages which are used in day to day security analyst job role

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pigipur (V), B. S. Nagar (Post),  
Abdullapurmet (GA), B.S.N. (VT)-501 512.

---

---



**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**INTRODUCTION TO ANALYTICS (ASSOCIATE ANALYTICS -I)**  
**(PROFESSIONAL ELECTIVE - I)**

**B.Tech. III Year II Sem.**

**Course Code: CS615PE**

**Course Objectives:**

- To introduce the terminology, technology and its applications
- To introduce the concept of Analytics for Business
- To introduce the tools, technologies & programming languages which is used in day today analytics cycle

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pillur (V), Bataasingam (Post),  
Abdulapuram (M), R.R. Dist. HYD-231 512.

---

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**WEB TECHNOLOGIES LAB**

**B.Tech. III Year II Sem.**

**Course Code: CS605PC**

**Course Objectives:**

- To enable the student to program web applications using the following technologies HTML, Javascript , AJAX, PHP, Tomcat Server, Servlets, JSP

**Course Outcomes:**

- Use LAMP Stack for web applications
- Use Tomcat Server for Servlets and JSPs
- Write simple applications with Technologies like HTML, Javascript, AJAX, PHP,Servlets and JSPs
- Connect to Database and get results
- Parse XML files using Java (DOM and SAX parsers)

**Note:**

1. Use LAMP Stack (Linux, Apache, MySQL and PHP) for the Lab Experiments.Though not mandatory, encourage the use of Eclipse platform wherever applicable
2. The list suggests the minimum program set. Hence, the concerned staff is requested to add more problems to the list as needed



---

PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Figlipur (V), Bataingaram (Post),  
Abdulqarnet (O), R.R.Bida.HYD-501 512.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**DATA MINING**

**B.Tech. IV Year I Sem**


**Course Objectives:**

- Learn data mining concepts understand association rules mining.
- Discuss classification algorithms learn how data is grouped using clustering techniques.
- To develop the abilities of critical analysis to data mining systems and applications.
- To implement practical and theoretical understanding of the technologies for data mining
- To understand the strengths and limitations of various data mining models;

**Course Outcomes:**

- Ability to perform the preprocessing of data and apply mining techniques on it.
- Ability to identify the association rules, classification and clusters in large data sets.
- Ability to solve real world problems in business and scientific information using data mining
- Ability to classify web pages, extracting knowledge from the web

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pigalpur (V), Baitadiguda (Post),  
Abdulnagar Rd, B.S.Road, 173-021 S. 2.

---

**PRINCIPLES OF PROGRAMMING LANGUAGES**

**B.Tech. IV Year I Sem**

**Course Objectives:**

- To introduce the various programming paradigms.
- To understand the evolution of programming languages.
- To understand the concepts of OO languages, functional languages, logical and scripting languages.
- To introduce the principles and techniques involved in design and implementation of modern programming languages.
- To introduce the notations to describe the syntax and semantics of programming languages.
- To introduce the concepts of concurrency control and exception handling.
- To introduce the concepts of ADT and OOP for software development.

**Course Outcomes:**

- Ability to express syntax and semantics in formal notation.
- Ability to apply suitable programming paradigm for the application.
- Ability to compare the features of various programming languages.
- Able to understand the programming paradigms of modern programming languages.
- Able to understand the concepts of ADT and OOP.
- Ability to program in different language paradigms and evaluate their relative benefits.

---

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Piplipur (V), Batawanganam (Post),  
Abdulgannet (M), R.N.Siruguduru-501 512.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**PYTHON PROGRAMMING**

**B.Tech. IV Year I Sem**


**Course Objectives:**

- Learn Syntax and Semantics and create Functions in Python.
- Handle Strings and Files in Python.
- Understand Lists, Dictionaries and Regular expressions in Python.  
Implement Object Oriented Programming concepts in Python.
- Build Web Services and introduction to Network and Database Programming in Python.

**Course Outcomes:**

- Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
- Demonstrate proficiency in handling Strings and File Systems.
- Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
- Interpret the concepts of Object-Oriented Programming as used in Python.
- Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

---

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Piplur (V), Balasimpiram (Dist),  
Andhra Pradesh 521 102

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**WEB SCRIPTING LANGUAGES**

**B.Tech. IV Year I Sem**


**Course Objectives**

- Introduces scripting languages such as Perl, Ruby and TCL.
- Learning TCL.

**Course Outcomes**

- Comprehend the differences between typical scripting languages and typical system and application programming languages.
- Gain knowledge of the strengths and weakness of Perl, TCL and Ruby; and select an appropriate language for solving a given problem.
- Acquire programming skills in scripting language.

---

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pigalpur (V), Bapatlagudem (Post),  
Maddurpetal GA, B.S.Sat.HYO-501 512.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**INTERNET OF THINGS**

**B.Tech. IV Year I Sem**


**Course Objectives**

- To introduce the terminology, technology and its applications
- To introduce the concept of M2M (machine to machine) with necessary protocols
- To introduce the Python Scripting Language which is used in many IoT devices
- To introduce the Raspberry PI platform, that is widely used in IoT applications
- To introduce the implementation of web based services on IoT devices.

**Course Outcomes**

- Interpret the impact and challenges posed by IoT networks leading to new architectural models.
- Compare and contrast the deployment of smart objects and the technologies to connect them to network.
- Appraise the role of IoT protocols for efficient network communication. Elaborate the need for Data Analytics and Security in IoT.
- Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.

---

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), East Godavari (Dist),  
Andhra Pradesh 522 202, A.P. Dist. (V) 512.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**DISTRIBUTED SYSTEMS**

**B.Tech. IV Year I Sem**

**Course Objectives**

- To understand what and why a distributed system is.
- To understand theoretical concepts, namely, virtual time, agreement and consensus protocols.
- To understand IPC, Group Communication & RPC Concepts. To understand the DFS and DSM Concepts.
- To understand the concepts of transaction in distributed environment and associated concepts, namely, concurrency control, deadlocks and error recovery.

**Course Outcomes**

- Able to comprehend and design a new distributed system with the desired features.
- Able to start literature survey leading to further research in any subarea.
- Able to develop new distributed applications.

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pulipur (V), East Godavari (Dist),  
Abdulapur (M), R.R. Dist. N. D-501 512.

---



**MACHINE LEARNING**

**B.Tech. IV Year I Sem**

**Course Objectives**

- This course explains machine learning techniques such as decision tree learning, Bayesian learning etc.
- To understand computational learning theory.
- To study the pattern comparison techniques.

**Course Outcomes**

- Understand the concepts of computational intelligence like machine learning
- Ability to get the skill to apply machine learning techniques to address the real time problems in different areas
- Understand the Neural Networks and its usage in machine learning application.



---

PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Fogilpur (V), Bapatla (Dist),  
Abdulapuri Rd, Bapatla-512 512.

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**SOFTWARE PROCESS AND PROJECT MANAGEMENT**

**B.Tech. IV Year I Sem**

**Course Objectives**

- To acquire knowledge on software process management
- To acquire managerial skills for software project development To understand software economics

**Course Outcomes**

- Gain knowledge of software economics, phases in the life cycle of software development, project organization, project control and process instrumentation
- Analyze the major and minor milestones, artifacts and metrics from management and technical perspective
- Design and develop software product using conventional and modern principles of software project management

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pondur (V), Nellore District  
Andhra Pradesh 524 102, India

**COMPUTATIONAL COMPLEXITY**

**B.Tech. IV Year I Sem**


**Course Objectives**

- Introduces to theory of computational complexity classes
- Discuss about algorithmic techniques and application of these techniques to problems.
- Introduce to randomized algorithms and discuss how effective they are in reducing time and space complexity.
- Discuss about Graph based algorithms and approximation algorithms  
Discuss about search trees

**Course Outcomes**

- Ability to classify decision problems into appropriate complexity classes
- Ability to specify what it means to reduce one problem to another, and construct reductions for simple examples.
- Ability to classify optimization problems into appropriate approximation complexity classes
- Ability to choose appropriate data structure for the given problem
- Ability to choose and apply appropriate design method for the given problem

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Sattenapalle (Post),  
Abdulquader ML R.R.Sec.HVD-511 512.

---

**CLOUD COMPUTING**


**B.Tech. IV Year I Sem**

**Course Objectives**

- This course provides an insight into cloud computing
- Topics covered include- distributed system models, different cloud service models, service-oriented architectures, cloud programming and software environments, resource management.

**Course Outcomes**

- Ability to understand various service delivery models of a cloud computing architecture.
- Ability to understand the ways in which the cloud can be programmed and deployed.  
Understanding cloud service providers.



---

Annamacharya Institute of  
Technology & Sciences  
Pulipati (V), Guntur District (AP),  
Andhra Pradesh 522 202

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**BLOCKCHAIN TECHNOLOGY**


**B.Tech. IV Year I Sem**

**Course Objectives**

- To Introduce block chain technology and Cryptocurrency

**Course Outcomes**

- Learn about research advances related to one of the most popular technological areas today.

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Batainguram (Post),  
Abdullapuram (TA, R.R.Stn.1173-601 512.

---

---

**SOCIAL NETWORK ANALYSIS**


**B.Tech. IV Year I Sem**

**Course Objectives**

- To understand the concept of semantic web and related applications.
- To learn knowledge representation using ontology.
- To understand human behaviour in social web and related communities.
- To learn visualization of social networks.

**Course Outcomes**

- Develop semantic web related applications.
- Represent knowledge using ontology.
- Predict human behaviour in social web and related communities.
- Visualize social networks.



**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Tadipatriam (Dist),  
Andhra Pradesh 521, P.O.Box:HYD-521 912.

---

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**DATA MINING LAB**


**B.Tech. IV Year I Sem**

**Course Objectives**

- To obtain practical experience using data mining techniques on real world data sets.  
Emphasize hands-on experience working with all real data sets.

**Course Outcomes**

- Ability to add mining algorithms as a component to the existing tools
- Ability to apply mining techniques for realistic data.

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pottur (V), Puttur (Taluk),  
Maddur (Dist), R.S. Puttur-521 112.

---

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**PYTHON PROGRAMMING LAB**

**B.Tech. IV Year I Sem**

**Course Objectives**

- To be able to introduce core programming basics and program design with functions using Python programming language.
- To understand a range of Object-Oriented Programming, as well as in-depth data and information processing techniques.
- To understand the high-performance programs designed to strengthen the practical expertise.

**Course Outcomes**

- Student should be able to understand the basic concepts scripting and the contributions of scripting language
- Ability to explore python especially the object oriented concepts, and the built in objects of Python.
- Ability to create practical and contemporary applications such as TCP/IP network programming, Web applications, discrete event simulations

PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Piglipur (V), Baitalagaram (Dist),  
Abdullapurmet 511, P.R.Dist.HYD-501 512.



**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**WEB SCRIPTING LANGUAGES LAB**

**B.Tech, IV Year I Sem**

**Course Objectives**

- To Understand the concepts of scripting languages for developing web-based projects
- To understand the applications the of Ruby, TCL, Perl scripting languages

**Course Outcomes**

- Ability to understand the differences between Scripting languages and programming languages
- Able to gain some fluency programming in Ruby, Perl, TCL

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Bapatnam (Post),  
Addisapet 50, R.R.Dist.509 501 912.

---

---

**INFORMATION THEORY AND CODING**

**B.Tech. IV Year II Sem**

**Course Objectives:**

- To acquire the knowledge in measurement of information and errors.
- To Understand the importance of various codes for communication systems
- To design encoder and decoder of various codes.
- To know the applicability of source and channel codes

**Course Outcomes:**

- Upon completing this course, the student will be able to learn measurement of information and errors.
- Obtain knowledge in designing various source codes and channel codes
- Design encoders and decoders for block and cyclic codes
- Understand the significance of codes in various applications

PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pondicherry Region  
2019-2020

**REAL-TIME SYSTEMS**

**B.Tech. IV Year II Sem**

**Course Objectives**

- To provide broad understanding of the requirements of Real Time Operating Systems.
- To make the student understand, applications of these Real Time features using case studies.

**Course Outcomes**

- Be able to explain real-time concepts such as preemptive multitasking, task priorities, priority inversions, mutual exclusion, context switching, and synchronization, interrupt latency and response time, and semaphores.
- Able describe how a real-time operating system kernel is implemented.
- Able explain how tasks are managed.
- Explain how the real-time operating system implements time management.
- Discuss how tasks can communicate using semaphores, mailboxes, and queues.
- Be able to implement a real-time system on an embedded processor.
- Be able to work with real time operating systems like RT Linux, Vx Works, MicroC /OSII, Tiny OS

---

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Dattapattanam (Post),  
Abdullapuram GN, R.R. Dist. 517 512.

---

**DATA ANALYTICS**

**B.Tech. IV Year II Sem**

**Course Objectives:**

- To explore the fundamental concepts of data analytics.
- To learn the principles and methods of statistical analysis Discover interesting patterns, analyze supervised and unsupervised models and estimate the accuracy of the algorithms.
- To understand the various search methods and visualization techniques.

**Course Outcomes:**

After completion of this course students will be able

- To Understand the impact of data analytics for business decisions and strategy Carry out data analysis/statistical analysis
- To carry out standard data visualization and formal inference procedures Design Data Architecture Understand various Data Sources

PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Proddur (V), Guntur District  
Andhra Pradesh 515 102

**ADVANCED ALGORITHMS**

**B.Tech. IV Year II Sem.**

**Course Objectives:**

- Introduces the recurrence relations for analyzing the algorithms. Introduces the graphs and their traversals.
- Describes major algorithmic techniques (divide-and-conquer, greedy, dynamic programming, Brute Force, Transform and Conquer approaches) and mention problems for which each technique is appropriate.
- Describes how to evaluate and compare different algorithms using worst-case, average-case and best-case analysis.
- Introduces string matching algorithms. Introduces linear programming.

**Course Outcomes:**

- Ability to analyze the performance of algorithms.
- Ability to choose appropriate data structures and algorithm design methods for a specified application.
- Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs.

---

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pondicherry (V), Sub-campus (P)  
At: ... ..

---

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**COMPUTER FORENSICS**

**B.Tech. IV Year II Sem**


**Course Objectives:**

- A brief explanation of the objective is to provide digital evidences which are obtained from digital media.
- In order to understand the objectives of computer forensics, first of all, people have to recognize the different roles computer plays in a certain crime.
- According to a snippet from the United States Security Service, the functions computer has in different kinds of crimes.

**Course Outcomes:**

- Students will understand the usage of computers in forensic, and how to use various forensic tools for a wide variety of investigations.
- It gives an opportunity to students to continue their zeal in research in computer forensics.

---

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Science  
Projapur (V), East Godavari Dist  
Abdulquader S.S. RA, IIT

---

**NEURAL NETWORKS & DEEP LEARNING**


**B.Tech. IV Year II Sem**

**Course Objectives:**

- To introduce the foundations of Artificial Neural Networks
- To acquire the knowledge on Deep Learning Concepts
- To learn various types of Artificial Neural Networks
- To gain knowledge to apply optimization strategies

**Course Outcomes**

- Ability to understand the concepts of Neural Networks
- Ability to select the Learning Networks in modeling real world systems Ability to use an efficient algorithm for Deep Models
- Ability to apply optimization strategies for large scale applications

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Pondicherry (V), Karaikal  
District

## Program Educational Objectives:

To prepare students for an excellent corporate career,  
combining theory with practice, classroom teaching with management development.

**The students of Computer Science & Engineering course after passing out will**

## Program Outcomes:

On completion of the program the student shall be able to:

Demonstrate leadership skills

To understand and be conscious of the impact of managerial decisions on the triple bottom- line Profits, People and Planet.

Be adept at analyzing and applying theoretical constructs to various diverse business scenarios.

1. Graduates of the program will possess strong fundamental concepts in mathematics, science, engineering and Technology to address technological challenges.
2. Possess knowledge and skills in the field of Computer Science & Engineering and Information Technology for analyzing, designing and implementing complex engineering problems of any domain with innovative approaches.
3. Possess an attitude and aptitude for research, entrepreneurship and higher studies in the field of Computer Science & Engineering and Information Technology.
4. Have commitment to ethical practices, societal contributions through communities and life-long learning.
5. Possess better communication, presentation, time management and team work skills leading to responsible & competent professionals and will be able to address challenges in the field of IT at global level.
  - a. To create competencies and opportunities for Higher Education;
  - b. To create professional manpower skilled for the IT Industry;
  - c. To provide laboratory practices with advanced FOSS Tools;
  - d. To provide inter-disciplinary opportunities;
  - e. To provide opportunities of developing technical documents and presentation skills.
  - f. To provide opportunities of industry-Institute interactions;
  - g. To develop opportunities to promote Entrepreneurship and start-ups;

PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Plot No. 47, D. V. Road,  
At: ...



h. To nurture professional and social ethics

### **GRADUATE ATTRIBUTES**

Scholarship: research, inquiry and lifelong learning

Global citizenship: ethical, social and professional understanding

Eco-literate: sensitivity towards a sustainable environment

Employability: equipped with skills, attributes, leadership and entrepreneurial qualities that society needs; being capable of making a contribution to society through earning a living



PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Pitapur (V), Gatsasingaram (Dist),  
Abdullapuram GR, R.R. Dist (YSR) 501 112

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**

Piglipur, Abdullahapurmet(m), , Hyderabad, R.R. Dist. 501 512

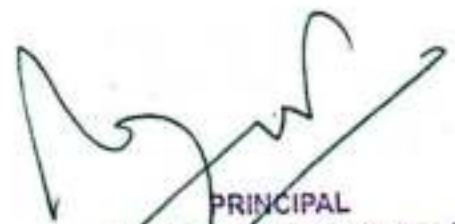
ME302PC: MECHANICS OF SOLIDS

B.Tech. II Year I Sem.

**Course Objectives:** The objective is to learn the fundamental concepts of stress, strain, and deformation of solids with applications to bars, beams, and columns. Detailed study of engineering properties of materials is also of interest. Fundamentals of applying equilibrium, compatibility, and force deformation relationships to structural elements are emphasized. The students are introduced to advanced concepts of flexibility and stiffness method of structural analysis. The course builds on the fundamental concepts of engineering mechanics course.

This course will advance the students' development of the following broad capabilities: Students will be able to understand basic concepts of stress, strain and their relations based on linear elasticity. Material behaviors due to different types of loading will be discussed. Students will be able to understand and know how to calculate stresses and deformation of a bar due to an axial loading under uniform and non-uniform conditions. Students will understand how to develop shear-moment diagrams of a beam and find the maximum moment/shear and their locations Students will understand how to calculate normal and shear stresses

**Program Outcomes:** Analyze the behavior of the solid bodies subjected to various types of loading Apply knowledge of materials and structural elements to the analysis of simple structures Undertake problem identification, formulation and solution using a range of analytical methods; Analyze and interpret laboratory data relating to behavior of structures and the materials they are made of, and undertake associated laboratory work individually and in teams. Expectation and capacity to undertake lifelong learning



PRINCIPAL  
Annacharya Institute of  
Technology & Sciences  
Piglipur (V), Betasingaram (Post),  
Abdullapurmet (TA), R.R. Dist. HYD-501 512

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
Piglipur, Abdullahapurmet(m), , Hyderabad, R.R. Dist. 501 512

ME305PC: THERMODYNAMICS B.Tech.

II Year I Sem.

**Course Objective:** To understand the treatment of classical Thermodynamics and to apply the First and Second laws of Thermodynamics to engineering applications

**Program Outcomes:** At the end of the course, the student should be able to Understand and differentiate between different thermodynamic systems and processes. Understand and apply the laws of Thermodynamics to different types of systems undergoing various processes and to perform thermodynamic analysis. Understand and analyze the Thermodynamic cycles and evaluate performance parameters.



PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Piglipur (V), Belasingaram (Post),  
Abdullapurmet (M), R.R. Dist. HYD-501 512

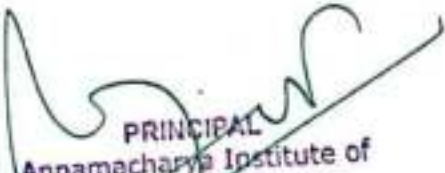
**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**  
Piglipur, Abdullahapurmet(m), , Hyderabad, R.R. Dist. 501 512

**MES01PC: DYNAMICS OF MACHINERY**

B.Tech. III Year I Sem.

**Course Objectives:** The objective is to introduce some of the components mainly used in IC Engines and make analysis of various forces involved. Subjects deals with topics like inertia forces in slider crank mechanism; IC Engine components & the analysis like governors is introduced. It also deals with balancing of rotating & reciprocating parts. Studies are made about balancing of multi cylinder engines, Radial engines etc. study of primary & secondary forces are considered while balancing. Finally they are introduced to the topic of vibrations. The study deals with linear, longitudinal, & torsional vibrations. The idea is to introduce the concept of natural frequency and the importance of resonance and critical speeds.

**Program Outcome:** the study of KOM & DOM are necessary to have an idea while designing the various machine members like shafts, bearings, gears, belts & chains and various I.C. Engine Components & Machine tool parts.

  
PRINCIPAL  
Annamacharya Institute of  
Technology & Sciences  
Piglipur (V), Betasingaram (Post),  
Abdullapurmet (M), R.R. Dist. HYD-501 512.

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES**

Piglipur, Abdullahapurmet(m), , Hyderabad, R.R. Dist. 501 512

**POWER PLANT ENGINEERING (Professional Elective – II)**

**B.Tech. IV Year I Sem Course Code: ME723PE/NT733PE**

**Course Objective:** The goal of this course is to become prepared for professional engineering design of conventional and alternative power-generation plants. The learning objectives include Analysis and preliminary design of the major systems of conventional fossil-fuel steam-cycle power plants. A working knowledge of the basic design principles of nuclear, gas turbine, combined cycle, hydro, wind, geothermal, solar, and alternate power plants. Awareness of the economic, environmental, and regulatory issues related to power generation.

**Program Outcomes:** At the end of the course students are able to: Understand the concept of Rankine cycle .Understand working of boilers including water tube,fire tube and high pressure boilers and determine efficiencies. Analyze the flow of steam through nozzles Evaluate the performance of condensers and steam turbines evaluate the performance of gas turbines

  
**PRINCIPAL**  
Annamacharya Institute of  
Technology & Sciences  
Piglipur (V), Betasingaram (Post),  
Abdullahapurmet (M), R.R. Dist. HYD-501 512