Course Outcomes Index

SITE 18 Regulations Course Outcomes
B. Tech. (Civil Engineering)

Course Outcomes for First Year First Semester Course	
Course Code: 18CMEGT1010	
Course Title: Technical English	
CO-1	Ability to understand Scientific vocabulary and use them confidently
CO-2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO-3	Ability to write error free simple technical passages
CO-4	Knowledge of writing different writing styles
CO-5	Confidence to write letters and technical reports clearly and coherently
CO-6	Get inspired by achievements and values upheld by a renowned technocrat.
Course Code: 18CMMAT102	
Course Title: ENGINEERING MATHEMATICS-I	
CO-1	Solve first order differential equations.
CO-2	Solve linear differential equations with constant coefficients.
CO-3	Find the extrema of a function.
CO-4	Solve partial differential equations
CO-5	Evaluate multiple integrals
CO-6	Verify vector integral theorems
Course Code: 18CMCHT1030	
Course Title: ENGINEERING CHEMISTRY	
CO-1	Able to rationalise periodic properties like ionization potential, electro negativity andoxidation states.
CO-2	Able to know the nature and working of various electrodes.
CO-3	Able to analyze bulk properties and processes using thermodynamic considerations.
CO-4	Able to synthesize organic molecules using different types of chemical reactions.
CO-5	Able to understand the concepts of atomic and molecular orbitals.
CO-6	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used for exciting different molecular energy levels.
Course Code: 18CMEET1040	
Course Title: BASIC ELECTRICAL ENGINEERING	
CO-1	Able to analyze DC circuits by using KCL, KVL and Network theorems
CO-2	Able to analyze AC circuits

CO-3	Able to explain the operation and compute performance of transformer
CO-4	Able to explain the construction and working of rotating electrical machines
CO-5	Able to describe DC-DC and DC-AC converters
CO-6	Able to explain about types of LV switch gear and types of batteries
Course Code: 18CMEGL1050	
Course Title: English Language Communication Skills Lab	
CO-1	Listening Comprehension
CO-2	Pronunciation
CO-3	Dialogues
CO-4	Interpersonal Communication Skills
CO-5	Presentation Skills
CO-6	Discussions and Debates
Course Code: 18CMCHL1060	
Course Title: ENGINEERING CHEMISTRY LABORATORY	
CO-1	Able to measure molecular properties like surface tension and viscosity
CO-2	Able to determine chloride content of given water sample.
CO-3	Able to synthesize a drug.
CO-4	Able to determine rate constant as a function of time.
CO-5	Able to determine strength of acids using conductivity meter.
CO-6	Able to determine amount of Fe (II) using potentiometer
Course Code: 18CMEEL1070	
Course Title: BASIC ELECTRICAL ENGINEERING LAB	
CO-1	Able to determine the time response and resonance of given RL, RC and RLCcircuits
CO-2	Able to determine the response using Superposition, Norton and Thevinins.
CO-3	Able to determine the power , efficiency and regulation of ac machines
CO-4	Able to determine the speed torque characteristics of dc and induction motors
CO-5	Able to analyze the operation of Buck and boost converter and voltage sourceinverter.
CO-6	Able to analyze the operation of LV Switch gear system.
Course Code: 18CMMSN1080	
Course Title: CONSTITUTION OF INDIA, PROFESSIONAL ETHICS &HUMAN RIGHTS	
CO-1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
CO-2	Understand state and central policies, fundamental duties.

CO-3	Understand Electoral Process, special provisions.
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
CO-5	Understand Engineering ethics and responsibilities of Engineers
CO-6	Understand Engineering Integrity & Reliability

Course Outcomes for First Year Second Semester Course	
Course Code: 18CMMAT2010	
Course Title: ENGINEERING MATHEMATICS-II	
CO-1	Solve system of linear equations
CO-2	Find eigen values and eigen vectors of a matrix
CO-3	Solve initial value problems by using Laplace transforms
CO-4	Find the solution of algebraic/ transcendental equations and also interpolate thefunctions.
CO-5	Evaluate numerical integration and to solve ordinary differential equations by usingnumerical methods.
CO-6	Find Fourier series of a periodic function and to determine the Fourier transform of a function
Course Code: 18CEPHT2020	
Course Title: ENGINEERING PHYSICS (Mechanics)	
CO-1	Understand the conditions for invariance and non invariance of Newton's secondlaw.
CO-2	Distinguish the various harmonic motions and resonance.
CO-3	Apply Kepler's laws to understand the planetary motions.
CO-4	Formulate Five-term acceleration formula with consideration of earth rotation effect.
CO-5	Understanding the concept of conservative and non conservative force fields.
CO-6	Describe the rigid body dynamics and moment of inertia.
Course Code: 18CMCST2030	
Course Title: PROGRAMMING FOR PROBLEM SOLVING	
CO-1	formulate algorithms, translate them into programs and correct program errors.
CO-2	choose right control structures suitable for the problem to be solved.
CO-3	decompose reusable code in a program into functions.
CO-4	make use of arrays, pointers, structures and unions effectively.
CO-5	store and retrieve data from permanent storage.
CO-6	learn file operations
Course Code: 18CMMEL2040	
Course Title: ENGINEERING GRAPHICS	
CO-1	Students will be able to construct Polygons using general methods, inscribe and describe polygons on circles, draw curves (parabola, ellipse and hyperbola, cycloids, involutes by general methods
CO-2	Students will be able to read, interpret and construct plain scales, diagonal scales and vernier scales
CO-3	Student will be able to draw orthographic projections of points, lines, Planes & Solids inclined to one reference plane. Students will be able to apply variousconcepts to solve practical problems related to engineering.
CO-4	Student will be able to draw sections and sectional views of Solids

CO-5	Student will be able to draw isometric view of lines, plane figures and simple solids.Student will be able to convert given isometric views into orthographic views. Students will be able to apply various concepts to solve practical problems related to Engineering
CO-6	Student will be able to draw objects using draw and modify toolbars of AutoCAD
Course Code: 18CEPHL2050	
Course Title: ENGINEERING PHYSICS LABORATORY	
CO-1	Study the mode of vibrations in Coupled Oscillators
CO-2	Determine the g & values using the knowledge in simple harmonic motions.
CO-3	Apply the phenomenon of resonance to verify the transverse laws of stretched string.
CO-4	Determine the frequency of vibrating body, velocity of sound in air usingresonance.
CO-5	Determine the moment of inertia of a rigid body.
CO-6	Verify the parallel axis and perpendicular theorems of moment of inertia.
Course Code: 18CMCSL2060	
Course Title: PROGRAMMING FOR PROBLEM SOLVING LAB	
CO-1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solving problems.
CO-2	Examine and analyze alternative solutions to a problem.
CO-3	Design an algorithmic solution to a problem using problem decomposition and step-wise refinement.
CO-4	Demonstrate conversion of iterative functions to recursive and vice-versa.
CO-5	Implement the concepts of arrays.
CO-6	Implement the structures, Unions and files.
Course Code: 18CMMEL2070	
Course Title: WORKSHOP/MANUFACTURING PRACTICE	
CO-1	Students will be able to make use of basic carpentry joints to make furniture.
CO-2	Students will be able to fabricate mechanical engineering assemblies using fitting joints.
CO-3	Students will be able to produce various machine components by using foundry, black smithy, machining and plastic moulding techniques.
Course Code: 18CMCHN2080	
Course Title: ENVIRONMENTAL SCIENCE	
CO-1	Able to know the importance of Environmental studies and the measures to be takento overcome global environmental challenges.
CO-2	Able to understand the concept of ecosystem and its diversity.
CO-3	Able to gain knowledge on natural resources.
CO-4	Able to understand the concept of biodiversity.
CO-5	Able to gain knowledge on environmental pollution.
CO-6	Gain knowledge on environmental legislation and global treaties.

Course Outcomes for second Year first Semester Course	
Course Code: 18CMMAT3010	
Course Title: ENGINEERING MATHEMATICS – III	
CO-1	Find the function of a complex variable
CO-2	Evaluate complex integration and expand functions using Taylor & Maclaurin‟sseries
CO-3	Evaluate integrals using Residues
CO-4	Find the statistical parameters for discrete distributions
CO-5	Find the statistical parameters for continuous distributions
CO-6	Test the hypothesis
Course Code: 18CMCET3020	
Course Title: ENGINEERING MECHANICS	
CO-1	Determine the resultant force and moment for a given system of forces
CO-2	Apply laws of friction to simple mechanisms with consideration of friction
CO-3	Draw free-body diagrams and solve statistics problems
CO-4	Determine centroid and moment of inertia of simple and composite bodies
CO-5	Calculate the motion characteristics of a body subjected to a given force system
CO-6	Solve the problems using work energy method and impulse –momentum method
Course Code: 18CECET3030	
Course Title: ENGINEERING GEOLOGY	
CO-1	Identify and classify the geological minerals.
CO-2	Identify and classify the various rocks engineering properties.
CO-3	Classify and measure the earthquake prone areas to practice the hazardzonation.
CO-4	Classify, monitor and measure the geological hazards.
CO-5	Prepares, analyse and interpret the Engineering Geologic maps.
CO-6	Investigate the project site for mega/mini civil engineering projects. Site selection formega engineering projects like Dams, Tunnels, disposal sites etc…
Course Code: 18CECET3040	
Course Title: SURVEYING AND GEOMATICS	
CO-1	Calculate angles, distances
CO-2	Finding of reduced Level Identify data collection methods and prepare field notes
CO-3	Understand the working principles of survey instruments applications errors
CO-4	Estimate measurement errors and apply corrections and will give proposed plane
CO-5	Operation& application of advance equipment
CO-6	Understand the application of GIS knowledge in field
Course Code: 18CECET3050	
Course Title: BUILDING MATERIALS AND CONCRETE TECHNOLOGY	

CO-1	understand the properties of various building materials.
CO-2	discriminate the elastic properties of concrete
CO-3	apply concept of admixtures in manufacturing of concrete.
CO-4	Design the concrete mix by BIS method.
CO-5	Test the fresh concrete properties and the hardened concrete properties.
CO-6	analyse the importance and effect of special Concrete in construction field
Course Code: 18CECEL3060	
Course Title: ENGINEERING GEOLOGY LAB	
CO-1	Elucidate the mega-scopic identification of rocks
CO-2	Categorize the rocks according to mega-scopic description
CO-3	Interpret geological maps
CO-4	Estimate the types of subsurface formation by using geophysical methods
Course Code: 18CECEL3070	
Course Title: SURVEYING FIELD WORK LAB	
CO-1	Find the area of Plot by using Various method employed in Chain Survey
CO-2	Determine Bearings and Angles in Closed Traverse
CO-3	Find out Distance between two points which are not accessible directly
CO-4	Determine Height of the building, vertical and horizontal angles by using Theodolite
CO-5	Locate Exact position of point by 2 point and 3 Point Problems
CO-6	Set out Curves on Roads, area by Total Station
Course Code: 18CECEL3080	
Course Title: COMPUTER-AIDED CIVIL ENGINEERING DRAWING LAB	
CO-1	Develop Parametric design and the conventions of formal engineering drawing
CO-2	Produce and interpret 2D & 3D drawings
CO-3	Communicate a design idea/concept graphically/ visually
CO-4	Examine a design critically and with understanding of CAD - The student learn to interpret drawings, and to produce designs using a combination of 2D and 3Dsoftware.
Course Code: 18CEECN3090	
Course Title: BASIC ELECTRONICS	
CO-1	Understand the characteristics of Diodes.
CO-2	Understand the characteristics of transistors.
CO-3	Describe different types of transistor amplifiers.
CO-4	Interpret different types of feedback amplifiers.
CO-5	Summarize different types of Oscillators.
CO-6	Determine the functioning of OP-AMP.
Course Outcomes for second Year second Semester Course	
Course Code: 18CECET4010	
Course Title: FLUID MECHANICS	

CO-1	Understand definitions of the basic terms used in fluid mechanics and variousproperties of fluids and can solve manometer problems
CO-2	Calculate the forces that act on submerged planes and curves; and solve Fluidkinematic problems
CO-3	Apply the continuity, momentum and energy principles to solve simple problems identify various types of fluid flows
CO-4	Apply appropriate equations and principles to analyze a variety of pipe flow problems
CO-5	Apply the concepts of measurement of flows
Course Code: 18CECET4020	
Course Title: STRENGTH OF MATERIALS	
CO-1	Understand the principles, theory of elasticity including strain/displacement andHooke's law relationships.
CO-2	Determination of shear force and bending moment in the beams due to variousloading conditions
CO-3	Determination of stresses developed in the beams due to various loading conditions.
CO-4	Evaluate the slope and deflection at any point on a beam subjected to a various loads
CO-5	Determination of direct stresses developed in the beams due to various loading conditions.
Course Code: 18CECET4030	
Course Title: ENVIRONMENTAL ENGINEERING	
CO-1	Plan and design the water and distribution networks and sewerage systems
CO-2	Identify the water source and select proper intake structure
CO-3	Characterization of water
CO-4	Select the appropriate appurtenances in the water supply
CO-5	Selection of suitable treatment flow for raw water treatments
CO-6	Analyze the suitability of water distribution methods in various regions.
Course Code: 18CECET4040	
Course Title: TRANSPORTATION ENGINEERING	
CO-1	Plan highway networks
CO-2	Design highway geometrics
CO-3	Design intersections and prepare traffic management plans
CO-4	Analyse quality of pavement material
CO-5	Design flexible and rigid pavements
CO-6	Understand the principle of construction and maintenance of highway pavements
Course Code: 18CMMST4050	
Course Title: ENGINEERING ECONOMICS AND FINANCIALMANAGEMENT	
CO-1	Equipped with the knowledge of managerial economics and estimating demand for aproduct.
CO-2	Examine the Production Concept and familiar with the concepts of iso-quants, iso-cost lines and MRTS
CO-3	Predict the cost of production and its relevance to managerial decision making
CO-4	Differentiate various the Markets and Pricing methods along with Business Cycles.
CO-5	Prepare Financial Statements along with Analysis

CO-6	Analyse and interpret various investment project proposals with the help of Capital Budgeting techniques
Course Code: 18CECEL4060	
Course Title: STRENGTH OF MATERIALS LAB	
CO-1	Find the basic parameters of Mild steel and Tor steel such strength parameters andetc.,
CO-2	Determine strength parameters of spring, wood and concrete
CO-3	determine flexural and torsion values & elastic constants of Solid material
CO-4	Determine hardness of metals
Course Code: 18CECEL4070	
Course Title: ENVIRONMENTAL ENGINEERING LAB	
CO-1	Estimation some important characteristics of water and wastewater in the laboratory
CO-2	Draw some conclusion and decide whether the water is potable or not.
CO-3	Decide whether the water body is polluted or not with reference to the stateparameters in the list of experiments
CO-4	Estimation of the strength of the sewage in terms of BOD and COD
Course Code: 18CECEL4080	
Course Title: MATERIAL TESTING LAB	
CO-1	Determine the basic properties of cement such Fineness Index, Normalconsistency, setting time & compressive strength of cement.
CO-2	Determine the workability of cement concrete by slump cone, compaction factor andVee–Bee tests
CO-3	Determine the specific gravity & Fineness modulus of coarse aggregate and f i n e aggregate by Sieve analysis.
CO-4	Determine the strength Characteristics of Aggregate
CO-5	Determine the basic properties of Binding material used in pavement construction
CO-6	Determine the strength characteristics of concrete
Course Outcomes for Third Year First Semester Course	
Course Code: 18CMBIT5010	
Course Title: Biology for Engineers	
CO-1	Describe how biological observations of 18th Century that lead to major discoveries.
CO-2	Convey that classification per se is not what biology is all about but highlight the underlying criteria,such as morphological, biochemical and ecological
CO-3	Highlight the concepts of recessiveness and dominance during the passage of genetic material fromparent to offspring
CO-4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverseas one can imagine
CO-5	Classify enzymes and distinguish between different mechanisms of enzyme action.
Course Code: 18CECET5020	
Course Title: THEORY OF STRUCTURES-I	
CO-1	To assess stresses across section of the thin cylinders to arrive at optimum sections to withstand theinternal pressure.
CO-2	To assess stresses across section of the thick cylinders to arrive at optimum sections to withstand theinternal pressure

CO-3	Analyse the portal frames by using general methods
CO-4	Analyze the crippling load carries by columns in various end conditions
CO-5	Determination of torsional resistance offered by various members
Course Code: 18CECET5030	
Course Title: GEO-TECHNICAL ENGINEERING	
CO-1	Evaluate factor of safety of infinite slopes based on different ground conditions
CO-2	Understand the significance of shear strength parameters in various geotechnical al analyses
CO-3	Determine various consolidation parameters of soil through laboratory test
CO-4	Differentiate among various field methods of compaction and their usage based on the type of soil.
CO-5	Understand the effect of capillary action and seepage flow direction on the effective stress at a pointin the soil mass
CO-6	Analytically calculate the effective permeability of anisotropic soil mass
Course Code: 18CECET5040	
Course Title: HYDROLOGY AND WATER RESOURCES ENGINEERING	
CO-1	**Remember** the hydrological cycle and its relevance to civil engineering. Make the student understandphysical process in hydrology and components of hydrologic cycle, **Remember** [B.T.L
CO-2	**Understand** theory for physical process and interaction. **Understand** [B.T.L
CO-3	**Applications** of hydrologic cycle Unit hydrograph. **Application**[B.T.L
CO-4	Understand flood frequency analysis, **analysis** of design flood, flood routing [B.T.L
CO-5	**Applications** of ground water movement and well hydraulics. **Applications** [B.T.L
CO-6	**Analysis** of dams, reservoirs and components of spillways. **Analysis** [B.T.L
Course Code: 18CECET5050	
Course Title: HYDRAULIC ENGINEERING	
CO-1	Solve uniform open channel flow problems.
CO-2	Solve non-uniform open channel flow problems.
CO-3	Compute flow profiles in channel transitions and analyze hydraulic transients.
CO-4	Apply the principals of dimensional analysis and similitude in hydraulic model testing.
CO-5	Understand the working principles of various hydraulic turbines.
CO-6	Understand the working principles of various pumps.
Open Electives offered by Civil Departments	
Course Code: 18CECE0506A	
Course Title: Civil Engineering - Societal & Global Impact	
CO-1	Understand the role of Civil Engineering in Modern World
CO-2	Understand various constructional Infrastructure and their importance in present environment
CO-3	modern transportation systems and their advantages

CO-4	Effect of global Warming and mitigation measures
CO-5	Understand the importance of Sustainability and Reduction of Green House Gas Emissions
Course Code: 18CECE0506B	
Course Title: Civil Engineering - Introduction to Civil Engineering	
CO-1	Understand the role of Civil Engineering in Modern World
CO-2	Know the details and working of various building materials
CO-3	Understand the concept of various construction management Techniques
CO-4	Know basic surveying methods and their applications
CO-5	Understand the importance of soil mechanics and rock mechanics in various structural designs
Course Code: 18CECEL5080	
Course Title:GEO-TECHNICAL ENGINEERING LAB	
CO-1	Determine index properties of soil and classify them.
CO-2	Determine permeability of soils.
CO-3	Determine Compaction, Consolidation and shear strength characteristics
Course Code: 18CECEL5090	
Course Title: FLUID MECHANICS & HYDRAULIC MECHINERYLAB	
CO-1	Determine rate of flow in fluids
CO-2	Determine coefficient of discharge and loss of head in flow
CO-3	Determine the efficiency of various turbines and pumps
Course Outcomes for Third Year Second Semester Course	
Course Code: 18CMEGT6010	
Course Title: PERSONALITY DEVELOPMENT & PROFRSSIONAL COMMUNICATION	
CO-1	Understand Personality development process and learn to implement effective techniques.
CO-2	Understand how people behave and regulate self behaviours and learn to work in a team.
CO-3	Know their career values, indentify their skills, set goals for enhancing their career skills andprepare for interviews
CO-4	Understand and learn how to deal with problems and practice problem solving skills.
CO-5	Learn the principles of professional communication & application of the same
Course Code: 18CECET6020	
Course Title: THEORY OF STRUCTURES-II	
CO-1	Distinguish between the determinate and indeterminate structures.
CO-2	Identify the behaviour of structures due to the expected loads, including the moving loads, actingon the structure.
CO-3	Estimate the bending moment and shear forces in beams for different fixity conditions.
CO-4	Analyze the continuous beams using various methods -, three moment method, slope deflectionmethod, energy theorems.
CO-5	Draw the influence line diagrams for various types of moving loads on beams/bridges.
CO-6	Analyze the loads in Pratt and Warren trusses when loads of different types and spans are passing over the truss.

Course Code: 18CECET6030	
Course Title: REINFORCED CONCRETE STRUCTURES	
CO-1	Work on different types of design philosophies [B.T.L
CO-2	Carryout analysis and design of flexural members and detailing [B.T.L
CO-3	Design structures subjected to shear, bond and torsion [B.T.L
CO-4	Design different type of slabs [B.T.L
CO-5	Design different type of compression members [B.T.L
CO-6	Workout on design of Flexural members by using Working stress method [B.T.L
Course Code: 18CECEP605A	
Course Title: FOUNDATION ENGINEERING	
CO-1	Understand the various types of shallow foundations and decide on their location basedon soil characteristics.
CO-2	Compute the magnitude of foundation settlement and decide on the size of the foundationaccordingly.
CO-3	Use the field test data and arrive at the bearing capacity
CO-4	Compute Stability of slopes of dams and embankments at different conditions
CO-5	Apply the principles of bearing capacity of piles and design them accordingly.
Course Code: 18CECEP605B	
Course Title: ARCHITECTURE & TOWN PLANNING	
CO-1	Distinguish architectural styles of eastern and western world.
CO-2	Understand the importance of Orders of architecture.
CO-3	Understand the principals of Composition
CO-4	Should be able to compose spaces of buildings using design concepts, planningprinciples.
CO-5	Should understand the town planning standards, landscaping features and regulationscontrolling expansion of the towns and the cities.
Course Code: 18CECEP605C	
Course Title: STRUCTURAL ANALYSIS BY MATRIX METHODS	
CO-1	Perform the structural analysis of determinate and indeterminate structures using classicalcompatibility methods, such as method of consistent deformations, force and equilibrium methods.
CO-2	Perform structural analysis using the stiffness method.
CO-3	Solve multiple degree of freedom two dimensional problems involving trusses, beams,frames and plane stress.
CO-4	Perform structural analysis using the Flexibility method
CO-5	Perform Sub Structuring, Joint Analysis and Support Displacements
Course Code: 18CECEP6051D	
Course Title: REMOTE SENSING & GIS APPLICATIONS	

CO-1	An idea about basic process of Remote sensing and Be familiar with ground, air and satellitebased sensor platforms(B.T.L
CO-2	Interpret the aerial photographs and satellite imageries(B.T.L
CO-3	GIS as an emerging tool for several civil engineering applications and Raster and Vector formatsof data and their usage in GIS(B.T.L
CO-4	Create and input spatial data for GIS application(B.T.L
CO-5	Apply RS and GIS concepts in land use and land cover operations(B.T.L
CO-6	Apply RS and GIS concepts in water resources engineering(B.T.L
Course Code: 18CECEL6060	
Course Title: IRRIGATION ENGINEERING DRAWING LAB	
CO-1	After studying this course, students will be able to To design various irrigation structures.
Course Code: 18CECEL6070	
Course Title: SOFTWARE APPLICATIONS IN CIVIL ENGINEERING LAB	
CO-1	Work comfortably on GIS software
CO-2	Digitize and create thematic map and extract important features
CO-3	Develop digital elevation model
CO-4	Use structural analysis software to analyze and design 2D and 3D frames
CO-5	Design and analyze retaining wall and simple towers using CADD software.
Course Code: 18CECEN6090	
Course Title: ADVANCED METHODS IN STRUCTURAL ANALYSIS	
CO-1	Differentiate Determinate and Indeterminate Structures
CO-2	Carryout lateral Load analysis of structures
CO-3	Analyze Cable and Suspension Bridge structures
CO-4	Analyze the Arches and study the effect of change in temperature
CO-5	Understand the concept of unsymmetrical bending in beams Location of neutral axis Deflectionof beams under unsymmetrical bending
Course Outcomes for Fourth Year First Semester Course	
Course Code: 18CECET7010	
Course Title: CONTRACTS, SPECIFICATIONS AND PROJECT MANAGEMENT	
CO-1	Illustrate about contract and tender documents
CO-2	Understand technical specifications for various works
CO-3	Identify various units utilized as a part of estimation
CO-4	Compute the quantity of the different material plan details sheet
CO-5	Analyze the cost of the different material plan details sheet
CO-6	Plan, control and minor construction projects with respect to time and cost
Course Code: 18CECET7020	
Course Title: DESIGN OF STEEL STRUCTURES	
CO-1	Design with different types of connections.

CO-2	Design of columns with and without lateral buckling
CO-3	Design of column bases.
CO-4	Design the beams.
CO-5	Design the plate girder.
CO-6	Design the gantry Girder
Course Code: 18CECEP7042-a	
Course Title: URBAN HYDROLOGY	
CO-1	Develop intensity duration frequency curves for urban drainage systems
CO-2	Develop design storms to size the various components of drainage systems
CO-3	Apply best management practices to manage urban flooding
CO-4	Prepare master drainage plan for an urbanized area
Course Code: 18CECEP7042-b	
Course Title: ADVANCED CONCRETE TECHNOLOGY	
CO-1	Identify the aggregate and cement properties
CO-2	Understand the behavior of fresh and hardened concrete
CO-3	Make aware the recent developments in concrete technology
CO-4	Understand factors affecting the strength, workability and durability of concrete
CO-5	Impart the methods of proportioning of concrete mixtures
Course Code: 18CECEP7042-c	
Course Title: SURFACE WATER HYDROLOGY	
CO-1	Acquire the knowledge of hydrological cycle(rainfall and runoff)
CO-2	Workout the measurements in watersheds
CO-3	Determine various hydrological parameters with appropriate techniques
CO-4	Calculate volume and rates of runoff with tools like hydrographs and unit hydrographs
CO-5	Apply appropriate measures for watershed management
Course Code: 18CECEP7042-d	
Course Title: OFFSHORE ENGINEERING	
CO-1	Understand offshore construction
CO-2	Understand offshore structures and various equipments.
CO-3	Analyze offshore structure loading mechanisms.
CO-4	Design mooring hardware components.
CO-5	Appraise Marine Hydrodynamics.
CO-6	Understand behaviour of Floating Structures
Course Code: 18CECEP7053-a	
Course Title: ADVANCED STRUCTURAL ANALYSIS	
CO-1	Understand the basics of structural Analysis

CO-2	Derive the equation for Bending of Simple and Cantilever beams
CO-3	Analyse Model material and model making
CO-4	Understand Finite element method for structural analysis
CO-5	Understand the Application of finite element method to one dimensional and two dimensional elements
CO-6	Understand the basics of structural Analysis
Course Code: 18CECEP7053-b	
Course Title: ADVANCED TRANSPORTATION ENGINEERING	
CO-1	Construct and Maintain Docks and Harbor
CO-2	Understand & Evaluate airport & aircraft characteristics
	Course Code: 18CECEP7053-c
	Course Title: EARTH RETAINING STRUCTURES
CO-1	Estimate the various earth pressures.
CO-2	Analyze the stability of rigid retaining structures.
CO-3	Design flexible retaining Structures
CO-4	Describe about free earth and fixed earth supports.
CO-5	Understand the different underground structures like pipes and braced walls.
Course Code: 18CECEP705-d	
Course Title: RURAL WATER SUPPLY AND ONSITE SANITATION SYSTEM	
CO-1	Understand definitions of the basic concept of sanitary engineering.
CO-2	Apply suitable methods of water treatment for rural areas.
CO-3	Understand the importance of water supply in rural areas.
CO-4	Apply the sanitary engineering concept and principals.
CO-5	Apply the different public sanitation methods in rural areas.
Course Outcomes for Fourth Year Second Semester Course	
Course Code: 18CECEP8014-a	
Course Title: INTELLIGENT TRANSPORTATION SYSTEMS	
CO-1	Understand the Historical background of communication techniques
CO-2	Apply the various ITS methodologies
CO-3	Design and implement ITS components
CO-4	Define the significance of ITS under Indian conditions
CO-5	Define the significance of ITS other than Indian conditions
Course Outcomes for Fourth Year SECOND Semester Course	
Course Code: 18CECEP8014-b	
Course Title: GROUND IMPROVEMENT TECHNIQUES	
CO-1	Possess the knowledge of various methods of ground improvement

CO-2	Check the suitability of various methods to different field hydraulic situations.
CO-3	Choose different grouting methods
CO-4	Acquire knowledge to suggest suitable admixtures to stabilize the ground.
CO-5	Design a reinforced earth embankment and to check its stability
CO-6	Apply various functions of Geosynthetics in Civil Engineering practice.
Course Code: 18CECEP8014-c	
Course Title: ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTMANAGEMENT PLANNING	
CO-1	Prepare EMP, EIS and EIA reports.
CO-2	Identify the risks and impact of the project.
CO-3	Select an appropriate EIA methodology.
CO-4	Conduct and Evaluate the EIA report.
CO-5	Estimate the cost benefit/ratio of the project.
CO-6	Know the audit procedures in the in the impact assessment
Course Code: 18CECEP8014-d	
Course Title: ENGINEERING WITH GEOSYNTHETICS	
CO-1	Realize the importance of geosynthetic materials.
CO-2	Design various geosynthetic components.
CO-3	Understand different methods with geosynthetics.
CO-4	Understand concepts of designing geosynthetics for various drainage problems.
CO-5	Understand various additional advantages of natural geo textiles.
CO-6	Apply the knowledge of geosynthetics in infrastructure facilities.
Course Code: 18CECEP8014-e	
Course Title: ADVANCED STRUCTURAL DESIGN	
CO-1	Design the raft foundations and different types of R.C.C. Retaining walls.
CO-2	Analyze and design different types of R.C.C Water tanks.
CO-3	Design the flat slabs
CO-4	Understand the concept in design of Bunkers and Silos
CO-5	Analyze and design the R.C.C Chimneys.
CO-6	Understand different types of transmission towers and concept of loading
Course Code: 18CECEP8025-a	
Course Title: PRESTRESSED CONCRETE	
CO-1	Understand the different methods of prestressing
CO-2	Estimate effective prestress including the short and long term losses
CO-3	Analyze and design prestressed concrete beams under flexure and shear
CO-4	Understand the relevant IS Codal provisions for prestressed concrete
CO-5	Apply pre tensioning post tensioning concepts in different constructions

CO-6	Understand the different methods of prestressing
Course Code: 18CECEP8025-b	
Course Title: ADVANCED FOUNDATION ENGINEERING	
CO-1	Estimate the bearing capacity of foundations using various methods.
CO-2	Determine the settlements and the corrections to be applied to settlements of footings.
CO-3	Calculate the ultimate bearing capacity of mat foundations.
CO-4	Understand the advanced concepts of pile foundations.
CO-5	Perform appropriate foundation practices on expansive soils.
Course Code: 18CECEP8025-c	
Course Title: GROUND WATER IMPROVEMENT & MANAGEMENT	
CO-1	Estimate aquifer parameters and yield of wells
CO-2	Analyse radial flow towards wells in confined and unconfined aquifers.
CO-3	Design wells and understand the construction practices.
CO-4	Determine the process of artificial recharge for increasing groundwater potential.
CO-5	Apply appropriate measures for groundwater management.
CO-6	Develop various ground water Models.
Course Code: 18CECEP8025-d	
Course Title: SOLID AND HAZARDOUS WASTE MANAGEMENT	
CO-1	Understand the different solid waste management techniques.
CO-2	Choose appropriate method of solid waste.
CO-3	Suggest the solid waste minimization technique.
CO-4	Design the solid waste management method.
CO-5	Suggest the appropriate hazardous waste management technique.
Course Code: 18CECEP8036-a	
Course Title: AIR, NOISE POLLUTION AND CONTROL	
CO-1	Judge the ambient air quality based on the analysis of air pollutants
CO-2	Apply particulate and gaseous control measures for an industry
CO-3	Understand the flume behavior in a prevailing Environmental condition
CO-4	Estimate carbon credits for various day to day activities
CO-5	Describe the noise pollution measures to be taken to control the noise pollution.
CO-6	Select the proper noise control measures
Course Code: 18CECEP8036-b	
Course Title: SOIL DYNAMICS AND MACHINE FOUNDATIONS	
CO-1	Describe the fundamentals of Vibration.
CO-2	Use theories of vibrations to find the behavior of soil under dynamic loading.
CO-3	Conduct various laboratories and field tests to determine the dynamic soil properties

	and its interpretation.
CO-4	Design machine foundations under different loads and soil conditions.
CO-5	Understand the concept of vibration isolators.
Course Code: 18CECEP8036-c	
Course Title: BRIDGE ENGINEERING	
CO-1	Explain different types of Bridges and IRC standards
CO-2	Design the concepts of Slab Bridges under various loadings
CO-3	Design the various elements of T-Beam bridge
CO-4	Design the Plate Girder Bridges
CO-5	Understand the design concepts of Box Culverts
Course Code: 18CECEP8036-d	
Course Title: CONTRACTS MANAGEMENT	
CO-1	Explain the Importance of Contracts and Overview of Contract Management
CO-2	Understand the types of contracts.
CO-3	Plan the performance parameters.
CO-4	Understand about contract administration risk management.
CO-5	Apply legal remedies for contracts.
Course Code: 18CECEP8047-a	
Course Title: REPAIR AND REHABILITATION OF STRUCTURES	
CO-1	Explain deterioration of concrete in structures
CO-2	Carryout analysis using NDT and evaluate structures
CO-3	Assess failures and causes of failures in structures
CO-4	Apply different materials and techniques for repairs
CO-5	Carryout physical evaluation and submit report on condition of the structure.
CO-6	Explain how rehabilitation to be done in different structures
Course Code: 18CECEP8036	
Course Title: DESIGN OF FORM WORK	
CO-1	Understand formwork, its requirements and types of formworks.
CO-2	Analyze the various loads acting on formwork.
CO-3	Apply formwork design skills to concrete structures.
CO-4	Analyze the working of flying formwork.
CO-5	Plan the safety steps involved in the design of form work and false work.
Course Code: 18CECEP8047-c	
Course Title : TRANSPORTATION ECONOMICS	
CO-1	Understand the concepts of decision making in finance budgeting

CO-2	Assess transportation demand and supply
CO-3	Estimate vehicle operation cost and accident cost
CO-4	Perform economic analysis of a transportation project
CO-5	Apply various financing methods in road projects
Course Code: 18CECEP8047	
Course Title : SUSTAINABLE CONSTRUCTION METHODS FOR BUILDINGS	
CO-1	Identify the factors to be considered in planning and construction of buildings.
CO-2	Understand the precast construction practices and techniques
CO-3	Plan the building form work and staging.
CO-4	Describe the cutting edge sustainable materials and activities.
CO-5	Understand the techniques of fire resistance and thermal insulation

SITE21 Regulations Course Outcomes
B. Tech. (Civil Engineering)

Course Outcomes for I Semester (First Year First Semester) Course	
Course Code: 21CMMAT1010	
Course Title: Engineering Mathematics - I	
CO-1	Solve the differential equations related to various engineering fields
CO-2	Solve the differential equations of higher order related to various engineering field
CO-3	familiarize with functions of several variables which is useful in optimization
CO-4	Solve the partial differential equations of first order
CO-5	Apply double integration techniques in evaluating areas bounded by region
Course Code: 21CEPHT1020	
Course Title: Engineering Physics	
CO-1	Understand the conditions for invariance and non-invariance of Newton's second law.
CO-2	Distinguish the various harmonic motions and resonance.
CO-3	Apply Kepler's laws to understand the planetary motions.
CO-4	Formulate Five-term acceleration formula with consideration of earth rotation effect.
CO-5	Understanding the concept of conservative and non conservative force fields.
Course Code: 21CMCHT1030	
Course Title: Engineering Chemistry	
CO-1	Interpret the mechanism of corrosion
CO-2	Summarize the problems faced in industries due to boiler troubles.
CO-3	Recall the properties and applications of advanced materials.
CO-4	Summarize the advantages of non-conventional energy resources and batteries.
CO-5	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used for exciting different molecular energy levels.
CO-6	Determine the strength of acid, base and some elements by volumetric and instrumental analysis.
Course Code: 21CMCST1040	
Course Title: Programming for Problem solving	
CO-1	Demonstrate computer components, algorithms, translate them into programs.
CO-2	Choose the suitable control structures for the problem to be solved.
CO-3	Make use of arrays, pointers, structures, and unions effectively.

CO-4	Organize reusable code in a program into functions.
CO-5	Demonstration of file operations.
Course Code: 21CEMEL1050	
Course Title: Engineering Graphics	
CO-1	Construct polygons, scales and engineering curves
CO-2	Draw the orthographic views of points, lines and planes
CO-3	Construct the projections of regular and irregular polyhedrons
CO-4	Draw the sectional views of solids
CO-5	Draw isometric/orthographic views using AutoCAD
Course Code: 21CEPHL1060	
Course Title: Engineering Physics Lab	
CO-1	Study the mode of vibrations in Coupled Oscillators
CO-2	Determine the g &*h* values using the knowledge in simple harmonic motions.
CO-3	Apply the phenomenon of resonance to verify the transverse laws of stretched string.
CO-4	Determine the frequency of vibrating body, velocity of sound in air using resonance.
CO-5	Determine the moment of inertia of a rigid body.
CO-6	Verify the parallel axis and perpendicular theorems of moment of inertia.
Course Code: 21CMCHL1070	
Course Title: Engineering Chemistry Lab	
CO-1	Measure molecular properties like surface tension and viscosity
CO-2	Determine chloride content of given water sample.
CO-3	Synthesize a drug.
CO-4	Determine rate constant as a function of time.
CO-5	Determine strength of acids using conductivity meter.
CO-6	Determine amount of Fe (II) using potentiometer
Course Code: 21CMCSL1080	
Course Title: Programming for Problem Solving Lab	
CO-1	Formulate algorithms, translate them into programs and correct program errors.
CO-2	Choose right control structures suitable for the problem to be solved.
CO-3	Decompose reusable code in a program into functions.
CO-4	Make use of arrays, pointers, structures and unions effectively.
CO-5	Store and retrieve data from permanent storage.
CO-6	learn file operations
Course Code: 21CMMSN1090	
Course Title: Constitution of India, Professional ethics and Human values	
CO-1	Have general knowledge and legal literacy and thereby to take up competitiveexaminations.
CO-2	Understand state and central policies, fundamental duties.

CO-3	Understand Electoral Process, special provisions.
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
CO-5	Understand Engineering ethics and responsibilities of Engineers
CO-6	Understand Engineering Integrity & Reliability

Course Outcomes for II Semester (First Year Second Semester) Course	
Course Code: 21CMEGT2010	
Course Title: Technical English	
CO-1	Ability to understand Scientific vocabulary and use them confidently
CO-2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO-3	Ability to write error free simple technical passages
CO-4	Knowledge of writing different writing styles
CO-5	Confidence to write letters and technical reports clearly and coherently
Course Code: 21CMMAT2020	
Course Title: Engineering Mathematics - II	
CO-1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications and solve system of linear equations (L6)
CO-2	Find the inverse and power of a matrix by Cayley-Hamilton theorem and reduce theQuadratic form (L3)
CO-3	Solve initial value problems by using Laplace transforms (L3)
CO-4	Find the solution of algebraic/ transcendental equations and also interpolate thefunctions(L3)
CO-5	Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (L3).
Course Code: 21CMEET2030	
Course Title: Basic Electrical Engineering	
CO-1	Understand basic electrical circuit operation.
CO-2	Understand the concept of Alternating Voltage and Current.
CO-3	Understand the operation of DC machines.
CO-4	Understand the working of measuring instruments.
CO-5	Understand the operation of different types of ac machines.
CO-6	Understand the concept of Electrical Safety.
Course Code: 21CMCST2040	
Course Title: Python Programming	
CO-1	Able to learn the fundamental concepts in the Python language
CO-2	Implementation of python iterative statements and strings
CO-3	Demonstrate python lists, dictionaries and functions

CO-4	Understand the concepts of modules and packages in python
CO-5	Complete coding challenges relating to object-oriented programming's essentialconcepts and techniques.
CO-6	Apply variety of error handling and GUI programming techniques
Course Code: 21ETETT2050	
Course Title: Engineering Mechanics	
CO-1	Determine resultant force and moment for different force systems.
CO-2	analyse the rigid bodies associated with frictional forces using conditions of equilibrium
CO-3	Locate the centroid / centre of gravity and determine the moment of inertia of planesections/solids.
CO-4	Understand the behaviour of moving bodies in rectilinear motion and solve kinematic equations of motion curves.
CO-5	Solve the problem using work energy method and impulse momentum method.
Course Code: 21CMEGL2060	
Course Title: English Communication Skills Lab	
CO-1	Listening Comprehension
CO-2	Pronunciation
CO-3	Dialogues
CO-4	Interpersonal Communication Skills
CO-5	Presentation Skills
CO-6	Discussions and Debates
Course Code: 21CMEEL2070	
Course Title: Basic Electrical Engineering Lab	
CO-1	Verify the Kirchoff's laws.
CO-2	Verify network theorems for a given circuit.
CO-3	Control the speed of DC motor.
CO-4	Analyze performance of single phase induction motor
CO-5	Analyze performance of three phase induction motor.
CO-6	Identify different types of earthling's
Course Code: 21CEMEL2080	
Course Title: Engineering Workshop Lab	
CO-1	Perform the joinery work of wooden pieces using carpentry.
CO-2	Perform the joinery work of metallic pieces using fitting.
CO-3	Produce the required shaped metallic products using black smithy.
CO-4	Make the green sand moulds using different patterns
CO-5	Fabricate different components using welding.
Course Code: 21CMCHN2090	

Course Title: Environmental Science	
CO-1	Obtain knowledge on global warming & climate change - Acid rains, ozone layerdepletion.
CO-2	Preserve several natural resources
CO-3	Summarize the concept of ecosystem
CO-4	Control different types of pollution
CO-5	Understand social issues and environmental legislation
CO-6	Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion.
Course Outcomes for III Semester (Second Year First Semester) Course	
Course Code: 21CMMAT3010	
Course Title: Engineering Mathematics - III	
CO-1	Interpret the physical meaning of different operators such as gradient, curl and divergence
CO-2	Estimate the work done against a field, and verify integral theorems
CO-3	Apply Cauchy-Riemann equations to complex functions in order to determine whether agiven continuous function is analytic
CO-4	Find the differentiation and integration of complex functions used in engineeringproblems
CO-5	Make use of the Cauchy residue theorem to evaluate certain integrals
Course Code: 21CECET3020	
Course Title: Mechanics of Solids	
CO-1	Study the basic materials behaviour under the influence of different external loading conditions and the support conditions.
CO-2	Draw the diagrams indicating the variation of the key performance features likebending moment and shear forces
CO-3	Understand bending concepts and calculation of section modulus and for determination of stresses developed in the beams and deflections due to various loading conditions
CO-4	Assess stresses across section of the thin and thick cylinders to arrive at optimumsections to withstand the internal pressure using lame`s equation.
CO-5	Analyse the stresses in thin and thick cylinders
Course Code: 21CECET3030	
Course Title: Fluid Mechanics	
CO-1	Understand definitions of the basic terms used in fluid and measurement of fluid pressure
CO-2	Calculate the forces that act on submerged planes and curves, identify various types of fluid flows and solve fluid kinematic problems
CO-3	Apply the continuity, momentum and energy principles to solve simple problems
CO-4	Apply appropriate equations and principles to analyze a variety of pipe flow problems
CO-5	Apply the concepts of measurement of flows and understand the basic concepts of Boundarylayer.
Course Code: 21CECET3040	
Course Title: Building Materials, Construction & Concrete Technology	

CO-1	
CO-2	Determine the characteristics and properties of a good building stone, good building bricks and tiles.
CO-3	Know more about timber and wood-based products, steel and some new materials.
CO-4	Know various building components
CO-5	Identify Quality Control tests on concrete making materials.
CO-6	Comprehend the behaviour of fresh and hardened concrete and Design concrete mixesas per IS and ACI code
Course Code: 21CECET3050	
Course Title: Surveying and Geomatics	
CO-1	Apply the knowledge to calculate the angles and distances.
CO-2	Interpret the survey data and compute areas and volumes and levels by different typesof equipments.
CO-3	Identify data collection methods and prepare field notes
CO-4	Construct the curves and know the use of modern survey instruments.
CO-5	Apply the knowledge of photogrammetric survey for mapping.
Course Code: 21CECEL3060	
Course Title: Concrete Technology Lab	
CO-1	Determine consistency, fineness of cement, setting times of cement, specific gravity andsoundness of cement.
CO-2	Determine compressive strength of cement, workability of cement concrete by compactionfactor, slump and Vee – Beetests
CO-3	Determine specific gravity of coarse aggregate and fine aggregate by Sieve analysis.
CO-4	Determine flakiness and elongation index of aggregates and bulking of sand
CO-5	Understand non-destructive testing procedures on concrete
Course Code: 21CECEL3070	
Course Title: Surveying Field Work	
CO-1	Calculate angles, distances
CO-2	Measurement of angles and distances by modern instruments
CO-3	Finding of reduced Level Identify data collection methods and prepare field notes
CO-4	Determinate the elevations of the various surface details
CO-5	Operation& application of advance equipment
Course Code: 21CECEL3080	
Course Title: Strength of Materials Lab	
CO-1	Find the basic parameters of Mild steel and Tor strength parameters.
CO-2	Determine strength parameters of spring, wood and concrete.
CO-3	Determine flexural and torsion values & elastic constants of Solid material.
CO-4	Determine hardness of metals.

CO-5	Determination of Modulus of elasticity of the material and Electrical resistance strain gauges.
Course Code: 21CECES3090	
Course Title: Computer Aided Civil Engineering Drawing (SOC)	
CO-1	Students able to use Auto CAD software Effectively
CO-2	Students able draw the drawings Auto CAD Software
Course Code: 21CMCHN4000	
Course Title: Essence of Indian Traditional Knowledge Mandatory course (AICTE suggested)	
CO-1	Understand and elucidate the basic knowledge of traditional knowledge to develop the physical and social changes on traditional knowledge system.
CO-2	Describe the significance of traditional knowledge protection to communicate thetraditional knowledge information
CO-3	Recognize the role of government on traditional knowledge to measure its impact onglobal economy.
CO-4	Explain the acts related to schedule tribes, traditional forest dwellers, plants protectionand farmers to inculcate the legal protection information.
CO-5	Illustrate the rules of biological diversity and geographical indicators for the protectionof traditional knowledge bill.
Course Outcomes for IV Semester (Second Year Second Semester) Course	
Course Code: 21CMMAT4010	
Course Title: Engineering Mathematics - IV	
CO-1	Find the Fourier series of a periodic functions
CO-2	Identify solution methods for partial differential equations that model physicalprocesses
CO-3	Apply the Concepts of Probability and Find the statistical Parameters of Discrete andContinuous distributions
CO-4	Estimate the properties of population from samples.
CO-5	Design the Components of classical Hypothesis test, Conclude the statistical inferential methods based on small and large samples
Course Code: 21CECET4020	
Course Title: Structural Analysis	
CO-1	Analyse the behaviour of Propped cantilever and fixed beams
CO-2	Analyse the continuous beams using slope deflection methods
CO-3	Analyse the continuous beams using moment distribution methods
CO-4	Calculate bending moment, normal thrust and radial shear to arches
CO-5	Analyse cables which are subjected to concentrated and uniformly distributed loads,
Course Code: 21CECET4030	
Course Title: Engineering Geology	
CO-1	Identify and classify the geological minerals

CO-2	Measure the rock strengths of various rocks
CO-3	Classify and measure the earthquake prone areas to practice the hazard zonation
CO-4	Classify, monitor and measure the Landslides and subsidence
CO-5	Prepares, analyses and interpret the Engineering Geologic maps
Course Code: 21CECET4040	
Course Title: Hydraulic & Hydraulics Machinery	
CO-1	Solve uniform open channel flow problems.
CO-2	Solve non-uniform open channel flow problems.
CO-3	Apply the principles of dimensional analysis and similitude in hydraulic modeltesting.
CO-4	Understand the working principles of various hydraulic turbines.
CO-5	Understand the working principles of various pumps.
Course Code: 21CMMST4050	
Course Title: Engineering Economics & Financial Management	
CO-1	Equipped with the knowledge of managerial economics and estimating demand for a product.
CO-2	Examine the Production Concept and familiar with the concepts of iso- quants, iso-cost lines and MRTS
CO-3	Predict the cost of production and its relevance to managerial decision making
CO-4	Differentiate various the Markets and Pricing methods along with Business Cycles.
CO-5	Prepare Financial Statements along with Analysis
CO-6	Analyse and interpret various investment project proposals with the help of Capital Budgetingtechniques
Course Code: 21CECEL4060	
Course Title: Engineering Geology Lab	
CO-1	Upon the successful completion of this course, the students will be able to:
CO-2	Identify Megascopic minerals & their properties.
CO-3	Identify Megascopic rocks & their properties.
CO-4	Identify the site parameters such as contour, slope & aspect for topography.
CO-5	Know the occurrence of materials using the strike & dip problems.
Course Code: 21CECEL4070	
Course Title: Fluid Mechanics and Hydraulic Machinery Lab	
CO-1	Demonstrate fluid flow principles.
CO-2	Apply the knowledge in calculating performance analysis in turbines and pumps thatcan be used in power plants and Analyse practical problems in all power plants.
CO-3	Measure discharge in pipes and demonstrate the characteristics curves of turbines andpumps.
CO-4	Measure discharge in pipes.

CO-5	Demonstrate the characteristics curves of turbines.
Course Code: 21CECEL4080	
Course Title: Building Planning & Drawing	
CO-1	Initiate the student to different building bye-laws and regulations.
CO-2	Impart the planning aspects of residential buildings and public buildings.
CO-3	Give training exercises on various signs and bonds and different building units.
CO-4	Impart the skills and methods of planning of various buildings.
CO-5	Draw Elevations and Cross Sections of given sloped and flat roof buildings
Course Code: 21CECES4090	
Course Title: Advanced Surveying (SOC)	
CO-1	Measure Remote Distance and Height using Total Station and Measure the Horizontal and Vertical Planes with Total Station
CO-2	Find the area of Plot by using Total Station
CO-3	Determine Distance, gradient, difference in height between two inaccessible pointsusing Total Station
CO-4	Setout curves, contouring and traversing using Total Station
CO-5	Find the position of stations using Global Positioning System

Department of Electrical and Electronics Engineering
SITE 18 Regulation Course Outcomes

Course Outcomes for First Year First Semester Course	
Course Code: 18CMEGT1010	
Course Title: Technical English	
CO-1	Ability to understand Scientific vocabulary and use them confidently
CO-2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO-3	Ability to write error free simple technical passages
CO-4	Knowledge of writing different writing styles
CO-5	Confidence to write letters and technical reports clearly and coherently
CO-6	Get inspired by achievements and values upheld by a renowned technocrat.
Course Code: 18CMMAT102	
Course Title: ENGINEERING MATHEMATICS-I	
CO-1	Solve first order differential equations.
CO-2	Solve linear differential equations with constant coefficients.
CO-3	Find the extrema of a function.
CO-4	Solve partial differential equations
CO-5	Evaluate multiple integrals
CO-6	Verify vector integral theorems
Course Code: 18CMCHT1030	
Course Title: ENGINEERING CHEMISTRY	
CO-1	Able to rationalise periodic properties like ionization potential, electro negativity and oxidation states.
CO-2	Able to know the nature and working of various electrodes.
CO-3	Able to analyze bulk properties and processes using thermodynamic considerations.
CO-4	Able to synthesize organic molecules using different types of chemical reactions.
CO-5	Able to understand the concepts of atomic and molecular orbitals.
CO-6	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used for exciting different molecular energy levels.
Course Code: 18CMEET1040	
Course Title: BASIC ELECTRICAL ENGINEERING	
CO-1	Able to analyze DC circuits by using KCL, KVL and Network theorems
CO-2	Able to analyze AC circuits
CO-3	Able to explain the operation and compute performance of transformer
CO-4	Able to explain the construction and working of rotating electrical machines

CO-5	Able to describe DC-DC and DC-AC converters
CO-6	Able to explain about types of LV switch gear and types of batteries
Course Code: 18CMEGL1050	
Course Title: English Language Communication Skills Lab	
CO-1	Listening Comprehension
CO-2	Pronunciation
CO-3	Dialogues
CO-4	Interpersonal Communication Skills
CO-5	Presentation Skills
CO-6	Discussions and Debates
Course Code: 18CMCHL1060	
Course Title: ENGINEERING CHEMISTRY LABORATORY	
CO-1	Able to measure molecular properties like surface tension and viscosity
CO-2	Able to determine chloride content of given water sample.
CO-3	Able to synthesize a drug.
CO-4	Able to determine rate constant as a function of time.
CO-5	Able to determine strength of acids using conductivity meter.
CO-6	Able to determine amount of Fe (II) using potentiometer
Course Code: 18CMEEL1070	
Course Title: BASIC ELECTRICAL ENGINEERING LAB	
CO-1	Able to determine the time response and resonance of given RL, RC and RLC circuits
CO-2	Able to determine the response using Superposition, Norton and Thevinins.
CO-3	Able to determine the power , efficiency and regulation of ac machines
CO-4	Able to determine the speed torque characteristics of dc and induction motors
CO-5	Able to analyze the operation of Buck and boost converter and voltage source inverter.
CO-6	Able to analyze the operation of LV Switch gear system.
Course Code: 18CMMSN1080	
Course Title: CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS	
CO-1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
CO-2	Understand state and central policies, fundamental duties.
CO-3	Understand Electoral Process, special provisions.
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
CO-5	Understand Engineering ethics and responsibilities of Engineers
CO-6	Understand Engineering Integrity & Reliability
Course Outcomes for First Year Second Semester Course	
Course Code: 18CMMAT2010	

Course Title: ENGINEERING MATHEMATICS-II	
CO-1	Solve system of linear equations
CO-2	Find eigen values and eigen vectors of a matrix
CO-3	Solve initial value problems by using Laplace transforms
CO-4	Find the solution of algebraic/ transcendental equations and also interpolate the functions.
CO-5	Evaluate numerical integration and to solve ordinary differential equations by using numerical methods.
CO-6	Find Fourier series of a periodic function and to determine the Fourier transform of a function
Course Code: 18CEPHT2020	
Course Title: ENGINEERING PHYSICS (Mechanics)	
CO-1	Understand the conditions for invariance and non invariance of Newton's second law
CO-2	Distinguish the various harmonic motions and resonance.
CO-3	Apply Kepler's laws to understand the planetary motions.
CO-4	Formulate Five-term acceleration formula with consideration of earth rotation effect.
CO-5	Understanding the concept of conservative and non conservative force fields.
CO-6	Describe the rigid body dynamics and moment of inertia.
Course Code: 18CMCST2030	
Course Title: PROGRAMMING FOR PROBLEM SOLVING	
CO-1	formulate algorithms, translate them into programs and correct program errors.
CO-2	choose right control structures suitable for the problem to be solved.
CO-3	decompose reusable code in a program into functions.
CO-4	make use of arrays, pointers, structures and unions effectively.
CO-5	store and retrieve data from permanent storage.
CO-6	learn file operations
Course Code: 18CMMEL2040	
Course Title: ENGINEERING GRAPHICS	
CO-1	Students will be able to construct Polygons using general methods, inscribe and describe polygons on circles, draw curves (parabola, ellipse and hyperbola, cycloids,involutes by general methods
CO-2	Students will be able to read, interpret and construct plain scales, diagonal scales and vernier scales
CO-3	Student will be able to draw orthographic projections of points, lines, Planes & Solids inclined to one reference plane. Students will be able to apply variousconcepts to solve practical problems related to engineering.
CO-4	Student will be able to draw sections and sectional views of Solids
CO-5	Student will be able to draw isometric view of lines, plane figures and simple solids.Student will be able to convert given isometric views into orthographic views. Students will be able to apply various concepts to solve practical problems related to engineering
CO-6	Student will be able to draw objects using draw and modify toolbars of AutoCAD
Course Code: 18CEPHL2050	
Course Title: ENGINEERING PHYSICS LABORATORY	

CO-1	Study the mode of vibrations in Coupled Oscillators
CO-2	Determine the g & values using the knowledge in simple harmonic motions.
CO-3	Apply the phenomenon of resonance to verify the transverse laws of stretched string.
CO-4	Determine the frequency of vibrating body, velocity of sound in air using resonance.
CO-5	Determine the moment of inertia of a rigid body.
CO-6	Verify the parallel axis and perpendicular theorems of moment of inertia.
Course Code: 18CMCSL2060	
Course Title: PROGRAMMING FOR PROBLEM SOLVING LAB	
CO-1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solving problems.
CO-2	Examine and analyze alternative solutions to a problem.
CO-3	Design an algorithmic solution to a problem using problem decomposition and step- wise refinement.
CO-4	Demonstrate conversion of iterative functions to recursive and vice-versa.
CO-5	Implement the concepts of arrays.
CO-6	Implement the structures, Unions and files.
Course Code: 18CMMEL2070	
Course Title: WORKSHOP/MANUFACTURING PRACTICE	
CO-1	Students will be able to make use of basic carpentry joints to make furniture.
CO-2	Students will be able to fabricate mechanical engineering assemblies using fitting joints.
CO-3	Students will be able to produce various machine components by using foundry, black smithy, machining and plastic moulding techniques.
Course Code: 18CMCHN2080	
Course Title: ENVIRONMENTAL SCIENCE	
CO-1	Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
CO-2	Able to understand the concept of ecosystem and its diversity.
CO-3	Able to gain knowledge on natural resources.
CO-4	Able to understand the concept of biodiversity.
CO-5	Able to gain knowledge on environmental pollution.
CO-6	Gain knowledge on environmental legislation and global treaties.
Course Outcomes for Second Year First Semester Course	
Course Code: 18CMMAT3010	
Course Title: ENGINEERING MATHEMATICS III	
CO-1	Find the function of a complex variable
CO-2	Evaluate complex integration and expand functions using Taylor &Maclaurin's series
CO-3	Evaluate integrals using Residues
CO-4	Find the statistical parameters for Discrete Random variables and Distributions
CO-5	Find the statistical parameters for Continuous Random variables and Distributions
CO-6	Test the hypothesis
Course Code: 18EEEET3020	

Course Title: ANALOG ELECTRONICS	
CO-1	Ability to Understand the characteristics of Diode &Transistors.
CO-2	Ability to analyze amplifier circuits
CO-3	Ability to design and analyze amplifier circuits MOSFET's.
CO-4	Ability to Understand the functioning of OP-AMP.
CO-5	Ability to design P, PI and PID controllers and lead/lag compensator using an op-amp.
CO-6	Ability to design nonlinear applications of op-amp.
Course Code: 18EEEET3030	
Course Title: ELECTRO MAGNETIC FIELDS	
CO-1	To understand the basic laws of electromagnetism.
CO-2	To obtain the electric and magnetic fields for simple configurations under static conditions
CO-3	To analyze boundary conditions
CO-4	To understand Maxwell's equation in different forms and different media.
CO-5	To analyze time varying electric fields
CO-6	To analyze time varying magnetic fields.
Course Code: 18EEEET3040	
Course Title: ELECTRICAL CIRCUIT ANALYSIS	
CO-1	Apply network theorems for the analysis of electrical circuits.
CO-2	Obtain the transient and steady-state response of electrical circuits.
CO-3	Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).
CO-4	Obtain transfer functions to various Electrical networks using Laplace transforms.
CO-5	Analyze behavior of transfer functions with poles and zeroes.
CO-6	Analyze two port circuit behaviors
Course Code: 18EEEET3050	
Course Title: ELECTRICAL MACHINES-I	
CO-1	Assimilate the concepts electromagnetic circuits.
CO-2	Mitigate the ill-effects of armature reaction and improve commutation in dcmachines.
CO-3	Analyze the characteristics of various DC motors.
CO-4	Analyze the characteristics of various DC Generators.
CO-5	Analyze the performance and to pre determine efficiency, regulation and losses ofa single phase transformer.
CO-6	Analyze the change in control voltages with tap changing methods and to achieve three phases to two-phase transformation.
Course Code: 18EEEEL3060	
Course Title: ANALOGELECTRONICSLAB	
CO-1	Ability to Understand the characteristics of Diode & Applications of Diode (working of rectifier, Clipping & Clamping circuits).
CO-2	AbilitytoUnderstandthecharacteristicsofBJT&analyzethedifferentamplifiercircuits.
CO-3	Ability to Understand the characteristics of MOSFET & analyze the Frequency Response of Common source amplifier circuit.

CO-4	Ability to analyze the Working of Phase shift oscillators.
CO-5	Ability to analyze the working of OPAMP based circuits like Square Wave and Triangular wave Generators
Course Code: 18EEEEL3070	
Course Title: ELECTRICAL CIRCUITS ANALYSIS LAB	
CO-1	To be able to apply various theorems.
CO-2	To be able to analyze the transient response of single phase circuits
CO-3	To be able to find resonance for RLC Circuits.
CO-4	To be able to determine parameters for two port networks.
CO-5	To be able to determine the self and mutual inductance of a magnetic circuit
CO-6	To be able measure active and reactive power of Poly phase Circuits.
Course Code: 18EEEEL3080	
Course Title: ELECTRICAL MACHINES LAB	
CO-1	Pre determine the regulation, performance and efficiency on DC machines.
CO-2	No load and Load the DC machine to obtain the characteristics, torque, output and efficiency.
CO-3	Control the speed of DC shunt motor by using armature control and field control methods.
CO-4	Separate the various losses present in DC shunt motor and single phase transformers.
CO-5	Pre determine the regulation and efficiency for a single phase transformer.
CO-6	Operate two transformers in parallel and to achieve three phase to two phase transformation.
Course Outcomes for Second Year Second Semester Course	
Course Code: 18EEEET4010	
Course Title: SIGNALSANDSYSTEMS	
CO-1	Distinguish the signals and systems and System properties
CO-2	Analyze behavior of continuous and discrete time LTI systems
CO-3	Analyze the continuous time signals and continuous time systems using Fourier series and Fourier transform
CO-4	Apply Laplace transform to analyze continues time signals and systems
CO-5	Apply Z transform to analyze discrete time signals and systems
CO-6	Apply sampling theorem to convert continuous time signals to discrete time signal and reconstruct back
Course Code: 18CMMET4020	
Course Title: ENGINEERING MECHANICS	
CO-1	Able to Resolve the forces into components, moment of force and its applications
CO-2	Construct free body diagrams and develop appropriate equilibrium equations.
CO-3	Determine centroid and moment of inertia for composite areas.
CO-4	Determine the kinematic relations of particles & rigid bodies.
CO-5	Apply equations of motion to particle and rigid body.
CO-6	Analyze motion of particles & rigid bodies using the principle of energy and momentum methods
Course Code: 18EEEET4030	

Course Title: DIGITALELECTRONICS	
CO-1	Understand working of logic families and logic gates.
CO-2	Design and implement Combinational logic circuits
CO-3	Design and implement Sequential logic circuits.
CO-4	Understand the process of Analog to Digital conversion and Digital to Analog conversion
CO-5	Be able to use PLDs to implement the given logical problem
CO-6	Understand working of Semiconductor memories
Course Code: 18EEEET4040	
Course Title: CONTROLSYSTEMS	
CO-1	Able to derive transfer function of different physical Systems
CO-2	Able to analyze the behavior of second order system with time domainspecifications
CO-3	Able to compute Stability of LTI system using Bode Plot NY Quist plot
CO-4	Able to compute Stability of LTI system using NY Quist plot
CO-5	Able to analyze the different controllers
CO-6	Able to determine control ability and Observability and STM of given system
Course Code: 18EEEET4050	
Course Title: ELECTRICAL MACHINES II	
CO-1	Illustrate the structure of AC machines and identify the various types of windings.
CO-2	Analyze the operation of three phase induction
CO-3	Analyze the performance of three phase induction motor.
CO-4	Analyze the performance of single phase induction and ac series motors
CO-5	Analyze the operation of synchronous machines for both salient and non-salient pole construction and their performance.
CO-6	Analyze the synchronization of alternators and estimate the synchronizing power, active and reactive power division.
Course Code: 18EEEEL4060	
Course Title: DIGITALELECTRONICSLAB	
CO-1	Demonstrate the truth table of various Expressions and Combinational Circuits using logic gates.
CO-2	Design, test and evaluate various Combinational Circuits such as Adders, Subtractions, Comparators, Multiplexers and DE multiplexers.
CO-3	Construct Flip flops, Counters and Shift Registers.
CO-4	Construct A-D Converters using OP AMP.
CO-5	Construct D-A Converters using OP AMP.
CO-6	Construct different types of Memories.
Course Code: 18EEEEL4070	
Course Title: CONTROLSYSTEMSLAB	
CO-1	Able to derive transfer function of different physical Systems
CO-2	Able to analyze the behavior of second order system with time domain specifications
CO-3	Able to compute Stability of LTI system using Bode Plot NY Quist plot

CO-4	Able to compute Stability of LTI system using NY Quist plot
CO-5	Able to analyze the different controllers
CO-6	Able to determine controllability and Observability of given system
Course Code: 18EEEEL4080	
Course Title: ELECTRICAL MACHINES LAB II	
CO-1	Obtain efficiency by conducting direct and indirect tests on three phase induction motor.
CO-2	Obtain regulation of alternator by E.M.F, M.M.F, Z.P.F methods and also performance curves.
CO-3	Obtain the V and Inverter V Curves of a three phase synchronous motor.
CO-4	Determine Xd and Xq of a salient pole synchronous machine.
CO-5	Control the speed of the single phase induction motor and to obtain equivalent circuit.
CO-6	Improve the power factor of single phase induction motor and to obtain its performance.
Course Outcomes for Third Year First Semester Course	
Course Code: 18EEEET5010	
Course Title: MICROPROCESSORS	
CO-1	Understand the fundamentals of 8086microprocessor
CO-2	Have a good insight of 8051 microcontroller
CO-3	Learn instruction set and programming of 8051microcontroller
CO-4	Understand the knowledge of memory and I/O interfacing
CO-5	Know the basics of interfacing 8051microcontroller
Course Code: 18EEEET5020	
Course Title: Power Systems – I (Apparatus and Modeling)	
CO-1	Understand the concepts of power systems.
CO-2	Understand the various power system components...
CO-3	Evaluate fault currents for different types of faults.
CO-4	Understand the generation of over-voltages and insulation coordination
CO-5	Understand basic protection schemes
CO-6	Understand concepts of HVDC power transmission and renewable energy generation
Course Code: 18CMMST5030	
Course Title: MANAGEMENT SCIENCE	
CO-1	Students are able to understand the concept and functions of Management, and Theories of Motivation, Styles of Leadership.
CO-2	Students are able to understand the Statistical Quality Control Techniques, Methods of inspection, the concept of Inventory Management and Control
CO-3	Students are understand the functional areas of organization i.e., Marketing Management, Human Resource Management, and Strategic Management
CO-4	Students are able to understand Project Management Techniques.
CO-5	Students are able to Understand the various contemporary issues in Management

	Practices like TQM and BPO etc.
Course Code: 18EEEET5040	
Course Title: POWER ELECTRONICS	
CO-1	Analyze the static and dynamic characteristics of SCRs and Design firing circuits for SCR..
CO-2	Explain the operation of single phase full–wave converters and analyze harmonics in the input current
CO-3	Explain the operation of three phase full–wave converters
CO-4	Analyze the operation of different types of DC-DC converters and AC-DC regulators
CO-5	Explain the operation of inverters and application of PWM techniques for voltage control and harmonic mitigation
Course Code: 18EEECP5060	
Course Title: MICROPROCESSOR LABORATORY	
CO-1	To be able to write programs on 8086 Microprocessor.
CO-2	To be able to write programs for different applications using 8086&8051
CO-3	Design and implement programs on 8051 Microcontroller
CO-4	To be able to interface Micro Controller with other electronic devices
CO-5	To Understand the concepts related to I/O and memory interfacing
Course Code: 18EEEEL5070	
Course Title: POWER SYSTEMS – 1 – LAB	
CO-1	Understand the concepts of power systems.
CO-2	Understand the various power system components
CO-3	Evaluate fault currents for different types of faults
CO-4	Understand the generation of over-voltages and insulation coordination.
CO-5	Understand basic protection schemes
CO-6	Understand concepts of HVDC power transmission and renewable energy generation

Course Code: 18EEEEL5080	
Course Title: POWER ELECTRONICS- LAB	
CO-1	Study the characteristics of various power electronic devices and design the gate drive circuits of SCR, IGBT and MOSFET.
CO-2	Analyze the performance of single phase and three phase full wave bridge converters with both resistive and inductive loads
CO-3	Analyze the operation of single phase and three phase AC voltage regulator with resistive and inductive loads
CO-4	Design and control the voltage ripple of Buck converter and Boost converter in CCM and DCM
CO-5	Analyze the operation of single phase square wave and PWM inverters
Course Outcomes for Third Year Second Semester Course	
Course Code: 18CMBIT6010	
Course Title: BIOLOGY FOR ENGINEERS	

CO-1	Describe how biological observations of 18th Century that lead to major discoveries
CO-2	Convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological
CO-3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO-4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO-5	Classifyenzymesanddistinguishbetweendifferentmechanismsofenzymeaction.
CO-6	Conveythat"GeneticsistobiologywhatNewton'slawsaretoPhysicalSciences"
Course Code: 18CMEGT6020	
Course Title: PERSONALITY DEVELOPMENT & PROFESSIONAL COMMUNICATION	
CO-1	Understand Personality development process and learn to implement effective techniques
CO-2	Understand how people behave and regulate self-behavior and learn to work in a team.
CO-3	Know their career values, identify their skills, set goals for enhancing their career skills
CO-4	Understand and learn how to deal with problems and practice problem solving skills.
CO-5	Learn the principles of professional communication & application of the same
CO-6	Face job interviews confidently and work a team effectively
Course Code: 18EEEET6030	
Course Title: POWER SYSTEMS – II (Operation and Control)	
CO-1	Analyze numerical problems in a power system
CO-2	Analyze stability constraints in a synchronous grid.
CO-3	Control the voltage, frequency and power flow in a power system
CO-4	Understand the monitoring and control of a power system.
CO-5	Understand the deregulation in power system.
CO-6	Analyze various demand side management techniques
Course Code: 18EEEET6040	
Course Title: ELECTRICAL MEASUREMENTS AND INSTRUMENTATION	
CO-1	An ability to analyze PMMC and mi meters and instrument transformers.
CO-2	An ability to calculate load consumption using energy meter.
CO-3	An ability to determine unknown physical parameters
CO-4	An ability to analyze performance of transducers
CO-5	An ability to apply the use of different digital meters.
Course Code: 18CMMST6050	
Course Title: ENGINEERING ECONOMICS AND FINANCIAL MANAGEMENT	
CO-1	Students are equipped with the knowledge of managerial economics and estimating demand for a product.
CO-2	Students understand Production and Cost concepts, estimating Cost Break even Analysis.
CO-3	Students are equipped with the knowledge on Markets and Pricing methods along with Business Cycles.

CO-4	Students are able to understand Accounting Concepts and Prepare Financial Statements- Analysis
CO-5	Students are able to analyze various investment project proposals with the help of Capital Budgeting techniques.
Course Code: 18EEEEP606A	
Course Title: ELECTRICAL DRIVES (Program Elective – 1)	
CO-1	Gain the knowledge on characteristics and operation of DC motor
CO-2	Analyze the operation of chopper fed DC motor drive
CO-3	Study the characteristics of multi quadrant DC drive
CO-4	Design control strategies for the DC motor drive
CO-5	Analyze the characteristics of induction motor drive
CO-6	Analyze and design various control strategies for induction motor drive
Course Code: 18EEEEP606B	
Course Title: HVDC TRANSMISSION SYSTEM (Program Elective – 1)	
CO-1	Realize the importance of HVDC transmission.
CO-2	Analyze the harmonics effect in converter performance
CO-3	Apply different control strategies to converters.
CO-4	Study various components of HVDC system
CO-5	Improve stability using HVDC Control strategies.
CO-6	Acquire knowledge on MTDC links
Course Code: 18EEEEP606C	
Course Title: CONTROL SYSTEM DESIGN (Program Elective – 1)	
CO-1	Elaborate the concepts of various designing fundamentals.
CO-2	Know the basic design in both time and frequency domain
CO-3	Understand the concepts of PID controllers
CO-4	Enhance the knowledge of design using state space
CO-5	Enumerate the basic concepts of nonlinearities and their performance
CO-6	Understand the concepts of singular points and performance of system
Course Code: 18EEEEL6070	
Course Title: POWER SYSTEMS – 1I - LAB	
CO-1	Use numerical methods to analyze a power system in steady state.
CO-2	Understand stability constraints in a synchronous grid.
CO-3	Understand methods to control the voltage, frequency and power flow.
CO-4	Understand the monitoring and control of a power system.
CO-5	Understand the basics of power system economics.
Course Code: 18EEEEL6080	
Course Title: ELECTRICAL MEASUREMENTS AND INSTRUMENTATION LAB	
CO-1	Able to apply various Measuring instruments.
CO-2	Able to analyze the Performance of Measuring instruments.

CO-3	Able to apply suitable bridge to determine unknown quantity.
CO-4	Able to determine Physical Parameters.
CO-5	Able to determine Temperature by using suitable method.
CO-6	Able analyze the performance of CT
Course Outcomes for Fourth Year First Semester Course	
Course Code: 18EEEET7010	
Course Title: POWER SYSTEM PROTECTION	
CO-1	Analyze the different components of a protection system.
CO-2	Evaluate the fault current due to different types of fault in a network.
CO-3	Analyze the protection schemes for different power system components.
CO-4	Explain the basic principles of digital protection.
CO-5	Evaluate the system protection schemes.
CO-6	Analyze the Wide-Area Measurement Systems for improving Protection systems.
Course Code: 18EEEEP702A	
Course Title: LINE COMMUTATED AND ACTIVE RECTIFIERS (Program Elective – 2)	
CO-1	Analyze diode rectifiers at various load conditions using filtering mechanism
CO-2	Apply filtering operation to thyristor rectifiers at various loads
CO-3	Acquire knowledge on topologies of multi pulse converter
CO-4	Analyze the operation of single switch boost converters
CO-5	Design controller for the ac dc bidirectional boost converter
CO-6	Analysis and design of control strategies for fly back converter
Course Code: 18EEEEP702B	
Course Title: SMARTGRID (Program Elective – 2)	
CO-1	Appreciate the difference between smart grid & conventional grid.
CO-2	Apply smart metering concepts to industrial and commercial installations
CO-3	Formulate solutions in the areas of smart substations, distributed generation and wide area measurements
CO-4	Come up with smart grid solutions using modern communication technologies.
CO-5	Acquire knowledge on micro grid and solar cells
CO-6	Analyze various techniques used in grid integration
Course Code: 18EEEEP702C	
Course Title: OPTIMIZATION TECHNIQUES (Program Elective – 2)	
CO-1	State and formulate the optimization problem, without and with constraints, by using design variables from an engineering design problem.
CO-2	Apply classical optimization techniques to minimize or maximize a multi-variable objective function, without or with constraints, and arrive at an optimal solution.
CO-3	Formulate a mathematical model and apply linear programming technique by using Simplex method. Also extend the concept of dual Simplex method foroptimal solutions
CO-4	Apply gradient methods to nonlinear optimization problems and use interior or

	exterior penalty functions for the constraints to derive the optimal solutions.
CO-5	Apply non-gradient methods to nonlinear optimization problems and use interior or exterior penalty functions for the constraints to derive the optimal solutions.
CO-6	Able to apply Genetic algorithms for simple electrical problems.
Course Code: 18EEEEP703A	
Course Title: ELECTRICAL AND HYBRID VEHICLES (Program Elective – 3)	
CO-1	Understand working of different configurations of electric and hybrid electric vehicles
CO-2	Understand hybrid vehicle configuration and its components, performance analysis
CO-3	Understand of electric vehicle drive systems
CO-4	Understand the properties of energy storage systems
CO-5	Understand different Energy management strategies
CO-6	Able to design hybrid electric vehicle
Course Code: 18EEEEP703B	
Course Title: POWER SYSTEM DYNAMICS AND STABILITY (Program Elective – 3)	
CO-1	Understand the problem of power system stability and its impact on the systemUnderstand the methods to improve stability.
CO-2	Analyze linear dynamical systems and use of numerical integration methods.
CO-3	Model various controller used to improve stability of power system
CO-4	Model different power system components for the study of stability
CO-5	Analyze the stability using various techniques
CO-6	Understand the methods to improve stability
Course Code: 18EEEEP703C	
Course Title: DIGITAL SIGNAL PROCESSING(Program Elective – 3)	
CO-1	To apply DFT for the analysis of digital signals &systems.
CO-2	To design FIR filters
CO-3	To design IIR filters
CO-4	To design optimal filtering using ARMA model
CO-5	To have a deep understanding on basics of digital signal processing which can be applied to transmission systems
CO-6	To Design appropriate filter for efficient system
Course Code: 18EEEEL7060	
Course Title: ELECTRONICS DESIGN LABORATORY	
CO-1	Understand the practical issues related to practical implementation of applications using electronic circuits.
CO-2	Choose appropriate components, software and hardware platforms
CO-3	Design a Printed Circuit Board, get it made and populate/solder it with components
CO-4	Work as a team with other students to implement an application
CO-5	Understand the practical problems related to electronic and analog system designing
CO-6	Implement the control techniques for various Embedded systems.

Course Outcomes for Fourth Year Second Semester Course	
Course Code: 18EEEEP801A	
Course Title: ADVANCED ELECTRIC DRIVES (Program Elective – 4	
CO-1	Know the operation of power electronic converters used in ac drives.
CO-2	Design various control strategies for ac drives.
CO-3	Understand the vector control strategies for ac motor drives
CO-4	Acquire knowledge on PMSM and BLDC motor drives
CO-5	Know the operation of Switched reluctance motor drives
CO-6	Understandtheimplementationofthecontrolstrategiesusingdigitalsignalprocessors
Course Code: 18EEEEP801B	
Course Title: WIND AND SOLAR ENERGY SYSTEMS (Program Elective – 4)	
CO-1	Understand the energy scenario and the consequent growth of the power generation from renewable energy sources.
CO-2	Understand the basic physics of wind and solar power generation
CO-3	Design the power electronics to interface for wind and solar generation
CO-4	Understand the issues related to the grid-integration of solar and wind energy systems
CO-5	Design solar system with different types of solar PV panels
CO-6	Design efficient solar system using MPPT algorithms
Course Code: 18EEEEP801C	
Course Title: INTELLIGENT CONTROL & ITS APPLICATIONS (Program Elective – 4)	
CO-1	Identify knowledge representations applied to artificial intelligence techniques
CO-2	Model artificial neuron and identify its use in Perceptron models and back propagation algorithm to multilayer feed forward networks.
CO-3	Develop rule based and decision making with the use of classical and fuzzy logic systems
CO-4	analyze concept of genetic algorithm
CO-5	Design fuzzy logic controller using MATLAB
CO-6	Analyze various applications of neural and fuzzy logic systems in electrical Engineering
Course Code: 18EEEEP802A	
Course Title: FLEXIBLE ALTERNATING CURRENT TRANSMISSION SYSTEMS (Program Elective – 5)	
CO-1	Understand power flow control in transmission lines using FACTS controllers.
CO-2	Explain operation and control of voltage source converter.
CO-3	Analyzecompensationmethodstoimprovestabilityandreducepoweroscillationsin the transmission lines
CO-4	Explain the method of shunt compensation using static VAR compensators
CO-5	Understand the methods of compensations using series compensators

CO-6	Explain operation of Unified Power Flow Controller (UPFC).
Course Code: 18EEEEP802B	
Course Title: POWER QUALITY (Program Elective – 5)	
CO-1	Differentiate between different types of power quality problems.
CO-2	Explain the sources of voltage sag, voltage swell, interruptions, transients, long duration over voltages and harmonics in a power system
CO-3	Analyze power quality terms and power quality standards
CO-4	Explain the principle of voltage regulation and power factor improvement methods.
CO-5	Demonstrate the relationship between distributed generation and power quality
CO-6	Explain the power quality monitoring concepts and the usage of measuring instruments
Course Code: 18EEEEP802C	
Course Title: DIGITAL CONTROL SYSTEMS (Program Elective – 5)	
CO-1	Obtain discrete representation of LTI systems.
CO-2	Analyze stability of open loop and closed loop discrete-time systems
CO-3	Design and analyze digital controllers
CO-4	Design state feedback and output feedback controllers
CO-5	Analyze the concepts of feedback control
CO-6	Understand the basic concepts of fast output sampling

Open Electives offered by Electrical and Electronics Engineering	
Course Code: 18XXEEO50XA	
Course Title: CONTROL SYSTEM DESIGN (Open Elective-1)	
CO-1	Elaborate the concepts of various designing fundamentals.
CO-2	Know the basic design in both time and frequency domain
CO-3	Understand the concepts of PID controllers
CO-4	Enhance the knowledge of design using state space
CO-5	Enumerate the basic concepts of nonlinearities and their performance
CO-6	Understand the concepts of singular points and performance of system
Course Code: 18XXEEO50XB	
Course Title: OPTIMIZATION TECHNIQUES (Open Elective-1)	
CO-1	State and formulate the optimization problem, without and with constraints, by using design variables from an engineering design problem.
CO-2	Apply classical optimization techniques to minimize or maximize a multi-variable objective function, without or with constraints, and arrive at an optimal solution
CO-3	Formulate a mathematical model and apply linear programming technique by using Simplex method. Also extend the concept of dual Simplex method foroptimal solutions
CO-4	Apply gradient methods to nonlinear optimization problems and use interior or exterior penalty functions for the constraints to derive the optimal

	solutions
CO-5	Apply non-gradient methods to nonlinear optimization problems and use interior or exterior penalty functions for the constraints to derive the optimal solutions
CO-6	Able to apply Genetic algorithms for simple electrical problems.
Course Code: 18XXEEO50XC	
Course Title: ELECTRICAL AND HYBRID VEHICLES (Open Elective-1)	
CO-1	Understand working of different configurations of electric and hybrid electric vehicles.
CO-2	Understand hybrid vehicle configuration and its components, performance analysis
CO-3	Understand of electric vehicle drive systems
CO-4	Understand the properties of energy storage systems
CO-5	Understand different Energy management strategies
CO-6	Design hybrid electric vehicle
Course Code: 18XXEEO70XA	
Course Title: ELECTRICAL ENERGY CONSERVATION & AUDITING (Open Elective-2)	
CO-1	To understand energy efficiency, scope, conservation, and technologies.
CO-2	To design energy efficient lighting systems
CO-3	To estimate/ calculate power factor of systems and propose suitable compensation techniques
CO-4	To understand energy conservation in HVAC systems.
CO-5	To calculate life cycle costing analysis and return on investment on energy efficient technologies.
CO-6	To calculate different economical aspects related projects election.
Course Code: 18XXEEO70XB	
Course Title: INTELLIGENT CONTROL & ITS APPLICATIONS (Open Elective-2)	
CO-1	Able to identify knowledge representations applied to artificial intelligence techniques
CO-2	Able to model artificial neuron and identify its use in Perceptron models and back propagation algorithm to multilayer feed forward networks
CO-3	Able to develop rule based and decision making with the use of classical and fuzzy logic systems
CO-4	Able to analyze concept of genetic algorithm
CO-5	Able design fuzzy logic controller using MATLAB
CO-6	Able to analyze various applications of neural and fuzzy logic systems in electrical Engineering
Course Code: 18XXEEO70XC	
Course Title: ELECTRICAL MATERIALS (Open Elective-2)	
CO-1	Understand various types of conducting, their properties in various conditions.
CO-2	Evaluate semiconductor materials and technologies.
CO-3	Understand various types of dielectric materials, their properties in various conditions
CO-4	Evaluate magnetic materials and their behavior
CO-5	Acquire Knowledge on Materials used in electrical engineering and applications
CO-6	Able to test Transformer oil as per standard

Course Code: 18XXEEO70XA	
Course Title: INDUSTRIAL ELECTRICAL SYSTEMS (Open Elective-3)	
CO-1	Acquire Knowledge on Tariff structure and protection components
CO-2	Understand various types wiring systems and IE rules
CO-3	Evaluate the Illumination technology
CO-4	Understand various types of cables
CO-5	Acquire Knowledge on PLC applications
CO-6	Acquire Knowledge to implement SCADA for various applications

Course Code: 18XXEEO70XB	
Course Title: ADVANCED CONTROL SYSTEMS (Open Elective-3)	
CO-1	Review of the state space representation of a control system: Formulation of different models from the signal flow graph, diagonalization
CO-2	To introduce the concept of controllability and observability. Design by poleplacement technique
CO-3	Analysis of a nonlinear system using Describing function approach and Phase plane analysis
CO-4	Analyze the stability of nonlinear system using phase plane approach
CO-5	The Lypanov's method of stability analysis of a system. Formulation of Euler Laugrange equation for the optimization of typical functional and solution
CO-6	Formulation of linear quadratic optimal regulator(LQR) problem by parameter adjustment and solving riccatti equation

Department of Electrical and Electronics Engineering
SITE 21 Regulation Course Outcomes

Course Outcomes for First Year First Semester Course	
Course Code: 21CMMAT1010	
Course Title: ENGINEERING MATHEMATICS-I (Calculus and Differential Equations)	
CO-1	Solve the differential equations related to various engineering fields (L3)
CO-2	Solve the differential equations of higher order related to various engineering fields (L3)
CO-3	familiarize with functions of several variables which is useful in optimization (L3)
CO-4	Solve the partial partial differential equations of first order (L3)
CO-5	Apply double integration techniques in evaluating areas bounded by region (L3).
Course Code: 21EEPHT1020	
Course Title: ENGINEERING PHYSICS	
CO-1	Distinguish the various harmonic motions and resonance.
CO-2	Apply Newton's law of motion to understand the motions of mechanical systems.
CO-3	Verify the invariance of Newton's equation of motion.
CO-4	Understand the concept of conservative and non-conservative motions.
CO-5	Formulate the rigid body dynamics.
CO-6	Study the structure- elastic property correlation under load within the elastic limits.
Course Code: 21CMCHT1030	
Course Title: Engineering Chemistry	
CO-1	Interpret the mechanism of corrosion
CO-2	Summarize the problems faced in industries due to boiler troubles.
CO-3	Recall the properties and applications of advanced materials.
CO-4	Summarize the advantages of non-conventional energy resources and batteries.
CO-5	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used for exciting different molecular energy levels.
CO-6	Determine the strength of acid, base and some elements by volumetric and instrumental analysis.
Course Code: 21CMCST1040	
Course Title: Programming for Problem Solving	
CO-1	Demonstrate computer components, algorithms, translate them into programs.
CO-2	Choose thesuitable control structures for the problem to besolved.
CO-3	Make use of arrays, pointers, structures,and unions effectively.
CO-4	Organize reusable code in a program into functions.
CO-5	Demonstration of file operations.

Course Code: 21CMMEL1050	
Course Title: Engineering Graphics	
CO-1	construct polygons, scales and engineering curves
CO-2	draw the orthographic views of points, lines and planes
CO-3	construct the projections of regular and irregular polyhedrons
CO-4	draw the sectional views of solids
CO-5	draw isometric/orthographic views using AutoCAD
Course Code: 21EEPHL1060	
Course Title: Engineering Physics Lab	
CO-1	Compare the theory and correlated with experiments.
CO-2	Design experiments.
CO-3	Analyze the experimental result.
CO-4	Apply appropriate techniques to perform the experiments.
CO-5	Understand the interaction of the light with semiconductor.
CO-6	Study the characteristic curves of the optoelectronic semiconductor devices.
Course Code: 21CMMEL1070	
Course Title: Engineering Chemistry Lab	
CO-1	Able to measure molecular properties like surface tension and viscosity
CO-2	Able to determine chloride content of given water sample.
CO-3	Able to synthesize a drug.
CO-4	Able to determine rate constant as a function of time.
CO-5	Able to determine strength of acids using conductivity meter.
CO-6	Able to determine amount of Fe (II) using potentiometer
Course Code: 21CMMEL1080	
Course Title: Programming for Problem Solving Lab	
CO1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solving problems.
CO2	Examine and analyze alternative solutions to a problem.
CO3	Design an algorithmic solution to a problem using problem decomposition and step- wise refinement.
CO4	Demonstrate conversion of iterative functions to recursive and vice-versa.
CO5	Implement the concepts of arrays, structures, Unions and files.
Course Code: 21CMMSN1090	
Course Title: CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS	
CO-1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
CO-2	Understand state and central policies, fundamental duties.

CO-3	Understand Electoral Process, special provisions.
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
CO-5	Understand Engineering ethics and responsibilities of Engineers
CO-6	Understand Engineering Integrity & Reliability
Course Outcomes for First Year Second Semester Course	
Course Code: 21CMEGT2010	
Course Title: Technical English	
CO-1	Ability to understand Scientific vocabulary and use them confidently
CO-2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO-3	Ability to write error free simple technical passages
CO-4	Knowledge of writing different writing styles
CO-5	Confidence to write letters and technical reports clearly and coherently
CO-6	Get inspired by achievements and values upheld by a renowned technocrat.
Course Code: 21CMMAT2020	
Course Title: ENGINEERING MATHEMATICS-II (Linear algebra, Laplace Transforms and Numerical Methods)	
CO-1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications and solve system of linear equations
CO-2	Find the inverse and power of a matrix by Cayley-Hamilton theorem and reduce the Quadratic form
CO-3	Solve initial value problems by using Laplace transforms
CO-4	Find the solution of algebraic/ transcendental equations and also interpolate thefunctions
CO-5	Apply different algorithms for approximating the solutions of ordinary differentialequations with initial conditions to its analytical computations
Course Code: 21CMEET2030	
Course Title: Basic Electrical Engineering	
CO-**1**	Understand basic electrical circuit operation.
CO-2	Understand the concept of Alternating Voltage and Current.
CO-3	Understand the operation of DC machines.
CO-4	Understand the working of measuring instruments.
CO-5	Understand the operation of different types of ac machines.
Course Code: 21CMCST2040	
Course Title: Python Programming	
CO-1	Explain thefundamental concepts in the Python language.
CO-2	Implementation of python iterative statements and strings.
CO-3	Demonstrate python lists, dictionaries, and functions.
CO-4	Understand the concepts of modules and packages in python.
CO-5	Complete coding challenges related to object-oriented programming.

CO-6	Apply variety of error handling and GUI programming techniques.
Course Code: 21EEMET2050	
Course Title: Engineering Mechanics	
CO-1	Determine resultant force and moment for different force systems.
CO-2	analyse the rigid bodies associated with frictional forces using conditions of equilibrium
CO-3	Locate the centroid / center of gravity and determine the moment of inertia of plane sections/solids.
CO-4	Understand the behavior of moving bodies in rectilinear motion and solve kinematic equations of motion curves.
CO-5	Solve the problem using work energy method and impulse momentum method.
Course Code: 21CMEGL2060	
Course Title: English Communication Skills Lab	
CO-1	Listening Comprehension, Pronunciation, Dialogues, Interpersonal Communication Skills ,Presentation Skills &Discussions and Debate
Course Code: 21CMEEL2070	
Course Title: Basic Electrical Engineering Lab	
CO1	Verify the Kirchoff's laws.
CO2	Verify network theorems for a given circuit.
CO3	Control the speed of DC motor.
CO4	Analyze performance of single phase induction motor
CO5	Analyze performance of three phase induction motor.
CO6	Identify different types of earthings
Course Code: 21CMMEL2080	
Course Title: Engineering Workshop Lab	
CO-1	Perform the joinery work of wooden pieces using carpentry.
CO-2	Perform the joinery work of metallic pieces using fitting.
CO-3	Produce the required shaped metallic products using black smithy.
CO-4	Make the green sand moulds using different patterns
CO-5	Fabricate different components using welding.
Course Code: 21CMCHN2090	
Course Title: ENVIRONMENTAL SCIENCE	
CO-1	Able to know the importance of Environmental studies and the measures to be taken to overcome global environmental challenges.
CO-2	Able to understand the concept of ecosystem and its diversity.
CO-3	Able to gain knowledge on natural resources.
CO-4	Able to understand the concept of biodiversity.
CO-5	Able to gain knowledge on environmental pollution.
CO-6	Gain knowledge on environmental legislation and global treaties.
Course Outcomes for Second Year First Semester Course	

Course Code: 21EEMAT3010	
Course Title: ENGINEERING MATHEMATICS III	
CO-1	Find the function of a complex variable
CO-2	Evaluate complex integration and expand functions using Taylor &Maclaurin's series
CO-3	Evaluate integrals using Residues
CO-4	Find the statistical parameters for Discrete Random variables and Distributions
CO-5	Find the statistical parameters for Continuous Random variables and Distributions
CO-6	Test the hypothesis
Course Code: 21EEEET3030	
Course Title: ANALOG ELECTRONICS	
CO-1	Ability to Understand the characteristics of Diode &Transistors.
CO-2	Ability to analyze amplifier circuits
CO-3	Ability to design and analyze amplifier circuits MOSFET's.
CO-4	Ability to Understand the functioning of OP-AMP.
CO-5	Ability to design P, PI and PID controllers and lead/lag compensator using an op-amp.
CO-6	Ability to design nonlinear applications of op-amp.
Course Code: 21EEEET3020	
Course Title: ELECTRICAL CIRCUIT ANALYSIS	
CO-1	Apply network theorems for the analysis of electrical circuits.
CO-2	Obtain the transient and steady-state response of electrical circuits.
CO-3	Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).
CO-4	Obtain transfer functions to various Electrical networks using Laplace transforms.
CO-5	Analyze behavior of transfer functions with poles and zeroes.
CO-6	Analyze two port circuit behaviors
Course Code: 21EEEET3050	
Course Title: DC Machines & Transformers	
CO-1	Assimilate the concepts of electromechanical energy conversion.
CO-2	Mitigate the ill-effects of armature reaction and improve commutation in dc machines.
CO-3	Understand the torque production mechanism and control the speed of dc motors.
CO-4	Analyze the performance of single phase transformers.
CO-5	Parallel transformers, control voltages with tap changing methods and achieve three-phase to two-phase transformation.
Course Code: 21EEEEL3060	
Course Title: ANALOGELECTRONICSLAB	
CO-1	Ability to Understand the characteristics of Diode & Applications of Diode (working of rectifier, Clipping & Clamping circuits).
CO-2	AbilitytoUnderstandthecharacteristicsofBJT&analyzethedifferentamplifiercircuits.

CO-3	Ability to Understand the characteristics of MOSFET & analyze the Frequency Response of Common source amplifier circuit.
CO-4	Ability to analyze the Working of Phase shift oscillators.
CO-5	Ability to analyze the working of OPAMP based circuits like Square Wave and Triangular wave Generators
Course Code: 21EEEEL30**70**	
Course Title: ELECTRICAL CIRCUITS ANALYSIS LAB	
CO-1	Apply various theorems to electrical circuit
CO-2	Analyze the transient response of single phase circuits
CO-3	Determine parameters for two port networks.
CO-4	Measure active and reactive power of Poly phase Circuits.
CO-5	Analyze nodal analysis using simulation software tool
Course Code: 21EEEEL3080	
Course Title: DC Machines & Transformers Lab	
CO-1	Pre determine the regulation, performance and efficiency on DC machines.
CO-2	No load and Load test of the DC machine to obtain the characteristics, torque,output and efficiency.
CO-3	Control the speed of DC shunt motor by using armature control and field controlmethods.
CO-4	Pre determine the regulation and efficiency for a single phase transformer.
CO-5	Operate two transformers in parallel and to achieve three phase to two phase transformation.
Course Code: 21EEEEL3090	
Course Title: Electrical Wiring & Installation	
CO-1	Demonstrate the Concept of basic Electricity, Single phase & three phase circuits.
CO-2	Identify the cable sizes and perform cable jointing.
CO-3	Perform House wiring
CO-4	Demonstrate the operation Ground – Fault circuit interrupters.
CO-5	Estimate Earth resistance value and its maintenance
Course Code: 21EEEEL3100	
Course Title: ELECTRO MAGNETIC FIELDS	
CO-1	To understand the basic laws of electromagnetism.
CO-2	To obtaintheelectricandmagneticfieldsforsimpleconfigurationsunderstaticconditions.
CO-3	To analyze boundary conditions
CO-4	To understand Maxwell's equation in different forms and different media.
CO-5	To analyze time varying magnetic fields.

Course Outcomes for Second Year Second Semester Course	
Course Code: 21EEEET4010	
Course Title: SIGNALS AND SYSTEMS	
CO-1	Distinguish the signals and systems and System properties
CO-2	Analyze behavior of continuous and discrete time LTI systems
CO-3	Analyze the continuous time signals and continuous time systems using Fourier series and Fourier transform
CO-4	Apply Laplace transform to analyze continues time signals and systems
CO-5	Apply Z transform to analyze discrete time signals and systems
CO-6	Apply sampling theorem to convert continuous time signals to discrete time signal and reconstruct back
Course Code: 21EEEET4020	
Course Title: DIGITAL ELECTRONICS	
CO-1	Understand working of logic families and logic gates.
CO-2	Design and implement Combinational logic circuits
CO-3	Design and implement Sequential logic circuits.
CO-4	Understand the process of Analog to Digital conversion and Digital to Analog conversion
CO-5	Be able to use PLDs to implement the given logical problem
CO-6	Understand working of Semiconductor memories
Course Code: 21CMMAT4030	
Course Title: MATHEMATICS-IV (Probability and Statistics)	
CO-1	Apply least squares method to fit a curve (L5)
CO-2	Apply the Concepts of Probability and Find the statistical Parameters of Discrete andContinuous distributions (L3)
CO-3	Apply Continuous probability Distributions (L3)
CO-4	Estimate the properties of population from samples. (L5)
CO-5	Design the Components of classical Hypothesis test, Conclude the statistical inferential methods based on small and large samples. (L6)
Course Code: 21EEEET4040	
Course Title: INDUCTION & SYNCHRONOUS MACHINES	
CO-1	Illustrate the structure of AC machines and identify the various types of windings.
CO-2	Explain the operation and performance of three phase induction motor.
CO-3	Analyze the torque-speed relation, performance of induction motor.
CO-4	Implement the starting of single phase induction motors and Analyze the operation of synchronous machines.
CO-5	Explain hunting phenomenon, implement methods of staring and correction of power factor with synchronous motor.
Course Code: 21CMMST4050	
Course Title:	

ENGINEERING ECONOMICS AND FINANCIAL MANAGEMENT	
CO-1	Students are equipped with the knowledge of managerial economics and estimatingdemand for a product.
CO-2	Students understand Production and Cost concepts, estimating Cost Break evenAnalysis.
CO-3	Students are equipped with the knowledge on Markets and Pricing methods along with Business Cycles.
CO-4	Students are able to understand Accounting Concepts and Prepare Financial Statements- Analysis
CO-5	Students are able to analyse various investment project proposals with the help of Capital Budgeting techniques.
Course Code: 21EEEEL4060	
Course Title: DIGITALELECTRONICSLAB	
CO-1	Demonstrate the truth table of various Expressions and Combinational Circuits using logic gates.
CO-2	Design, test and evaluate various Combinational Circuits such as Adders,Subtractions, Comparators, Multiplexers and DE multiplexers.
CO-3	Construct Flip flops, Counters and Shift Registers.
CO-4	Construct A-D &D-A Converters using OP AMP.
CO-5	Construct different types of Memories.
Course Code: 21EEEEL4070	
Course Title: ELECTRICAL MEASUREMENTS & INSTRUMENTATION LAB	
CO-1	To be able to apply various-Measuring instruments.
CO-2	To be able to analyze the Performance of Measuring instruments.
CO-3	To be able to apply suitable bridge to determine unknown quantity.
CO-4	To be able to determine-Physical Parameters.
CO-5	To be able analyze the performance of C.
Course Code: 18EEEEL4080	
Course Title: INDUCTION & SYNCHRONOUS MACHINES LAB	
CO-1	Obtain efficiency by conducting direct and indirect tests on three phase inductionmotor.
CO-2	Obtain regulation of alternator by E.M.F, M.M.F, Z.P.F methods and alsoperformance curves.
CO-3	Obtain the V and Inverter V Curves of a three phase synchronous motor.
CO-4	Control the speed of the three phase induction motor and to obtain equivalent circuit.
CO-5	Improve the power factor of single phase induction motor and to obtain itsperformance.
CO-6	Improve the power factor of single phase induction motor and to obtain its performance.
Course Code: 21EEEES4090	
Course Title: DESIGN OF ELECTRICAL CIRCUITS USINGENGINEERING SOFTWARE TOOLS (Skill Oriented Course)	
CO-1	write the MATLAB programs to simulate the electrical circuit problems
CO-2	simulate various circuits for electrical parameters
CO-3	simulate various wave form for determination of wave form parameters
CO-4	simulate RLC series and parallel resonance circuits for resonant parameters

CO-5	simulate magnetic circuits for determination of self and mutual inductances

SITE18 Regulations Course Outcomes

B. Tech. (Department of Mechanical Engineering)

Course Outcomes for First Year First Semester Course	
Course Code: 18CMEGT1010	
Course Title: Technical English	
CO-1	Ability to understand Scientific vocabulary and use them confidently
CO-2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO-3	Ability to write error free simple technical passages
CO-4	Knowledge of writing different writing styles
CO-5	Confidence to write letters and technical reports clearly and coherently
CO-6	Get inspired by achievements and values upheld by a renowned technocrat.
Course Code: 18CMMAT102	
Course Title: ENGINEERING MATHEMATICS-I	
CO-1	Solve first order differential equations.
CO-2	Solve linear differential equations with constantcoefficients.
CO-3	Find the extrema of afunction.
CO-4	Solve partial differentialequations
CO-5	Evaluate multipleintegrals
CO-6	Verify vector integraltheorems
Course Code: 18CMCHT1030	
Course Title:ENGINEERING CHEMISTRY	
CO-1	Able to rationalise periodic properties like ionization potential, electro negativity andoxidationstates.
CO-2	Able to know the nature and working of variouselectrodes.
CO-3	Able to analyze bulk properties and processes using thermodynamicconsiderations.
CO-4	Able to synthesize organic molecules using different types of chemicalreactions.
CO-5	Able to understand the concepts of atomic and molecular orbitals.
CO-6	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used for exciting different molecular energylevels.
Course Code: 18CMEET1040	
Course Title:BASIC ELECTRICAL ENGINEERING	
CO-1	Able to analyze DC circuits by using KCL, KVL andNetwork theorems
CO-2	Able to analyze ACcircuits
CO-3	Able to explain the operation and compute performanceof transformer
CO-4	Able to explain the construction and working ofrotating electricalmachines
CO-5	Able to describe DC-DC and DC-ACconverters

CO-6	Able to explain about types of LV switch gear and typesof batteries
Course Code: 18CMEGL1050	
Course Title: English Language Communication Skills Lab	
CO-1	ListeningComprehension
CO-2	Pronunciation
CO-3	Dialogues
CO-4	Interpersonal CommunicationSkills
CO-5	Presentation Skills
CO-6	Discussions andDebates
Course Code: 18CMCHL1060	
Course Title: ENGINEERING CHEMISTRY LABORATORY	
CO-1	Able to measure molecular properties like surface tensionand viscosity
CO-2	Able to determine chloride content of given watersample.
CO-3	Able to synthesize a drug.
CO-4	Able to determine rate constant as a function oftime.
CO-5	Able to determine strength of acids using conductivitymeter.
CO-6	Able to determine amount of Fe (II) usingpotentiometer
Course Code: 18CMEEL1070	
Course Title: BASIC ELECTRICAL ENGINEERING LAB	
CO-1	Able to determine the time response and resonance of given RL, RC and RLCcircuits
CO-2	Able to determine the response using Superposition, Norton and Thevinins.
CO-3	Able to determine the power , efficiency and regulation of ac machines
CO-4	Able to determine the speed torque characteristics of dc and induction motors
CO-5	Able to analyze the operation of Buck and boost converter and voltage source inverter.
CO-6	Able to analyze the operation of LV Switch gear system.
Course Code: 18CMMSN1080	
Course Title: CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS	
CO-1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
CO-2	Understand state and central policies, fundamental duties.
CO-3	Understand Electoral Process, special provisions.
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operativeSocieties
CO-5	Understand Engineering ethics and responsibilities of Engineers
CO-6	Understand Engineering Integrity &Reliability

Course Outcomes for First Year Second Semester Course	
Course Code: 18CMMAT2010	
Course Title: ENGINEERING MATHEMATICS-II	
CO-1	Solve system of linear equations
CO-2	Find eigen values and eigen vectors of matrix
CO-3	Solve initial value problems by using LaPlace transforms
CO-4	Find the solution of algebraic/ transcendental equations and also interpolatethe functions.
CO-5	Evaluate numerical integration and to solve ordinary differential equations by using numerical methods.
CO-6	Find Fourier series of a periodic function and to determine the Fourier transform offunction
Course Code: 18CEPHT2020	
Course Title: ENGINEERING PHYSICS (Mechanics)	
CO-1	Understand the conditions for invariance andnon invariance of Newton's secondlaw.
CO-2	Distinguish the various harmonic motions andresonance.
CO-3	Apply Kepler's laws to understand the planetarymotions.
CO-4	Formulate Five-term acceleration formulawith consideration of earth rotationeffect.
CO-5	Understanding the concept of conservative andnon conservative forcefields.
CO-6	Describe the rigid body dynamics and moment ofinertia.
Course Code: 18CMCST2030	
Course Title: PROGRAMMING FOR PROBLEM SOLVING	
CO-1	Formulate Algorithms, Translate Them Into Programs And Correct Programerrors.
CO-2	Choose Right Control Structures Suitable For The Problem To Be Solved.
CO-3	Decompose Reusable Code In A Program Intofunctions.
CO-4	Make Use Of Arrays, Pointers, Structures And Unionseffectively.
CO-5	Store And Retrieve Data From Permanentstorage.
CO-6	Learn Fileoperations
Course Code: 18CMMEL2040	
Course Title: ENGINEERING GRAPHICS	
CO-1	Students will be able to construct Polygons using general methods, inscribe and describe polygons on circles, draw curves (parabola, ellipse and hyperbola, cycloids,involutes by general methods
CO-2	Students will be able to read, interpret and construct plain scales, diagonal scales andvernier scales
CO-3	Student will be able to draw orthographic projections of points, lines, Planes &Solids inclined to one reference plane. Students will be able to apply various concepts to solve practical problems related toengineering.
CO-4	Student will be able to draw sections and sectional views ofSolids
CO-5	Student will be able to draw isometric view of lines, plane figures and simple solids.Student will be able to convert given isometric views into orthographic views. Students will be able toapply various concepts to solve practical problems related toengineering

CO-6	Student will be able to draw objects using draw and modify toolbars of AutoCAD
Course Code: 18CEPHL2050	
Course Title: ENGINEERING PHYSICS LABORATORY	
CO-1	Study the mode of vibrations in CoupledOscillators
CO-2	Determine the g & values using the knowledge in simple harmonicmotions.
CO-3	Apply the phenomenon of resonance to verify thetransverse laws of stretched string.
CO-4	Determine the frequency of vibrating body, velocity ofsound in air usingresonance.
CO-5	Determine the moment of inertia of a rigidbody.
CO-6	Verify the parallel axis and perpendicular theorems of moment ofinertia.
Course Code: 18CMCSL2060	
Course Title: PROGRAMMING FOR PROBLEM SOLVING LAB	
CO-1	Attain knowledge on using CODE BLOCKS and RAPTOR tools insolvingproblems.
CO-2	Examine and analyze alternative solutions to aproblem.
CO-3	Design an algorithmic solution to a problem using problem decomposition and step-wise refinement.
CO-4	Demonstrate conversion of iterative functions to recursive and vice-versa.
CO-5	Implement the concepts ofarrays.
CO-6	Implement the structures, Unions andfiles.
Course Code: 18CMMEL2070	
Course Title: WORKSHOP/MANUFACTURING PRACTICE	
CO-1	Students will be able to make use of basic carpentry joints to makefurniture.
CO-2	Students will be able to fabricate mechanical engineering assemblies usingfittingjoints.
CO-3	Students will be able to produce various machine components by using foundry,black smithy, machining and plastic mouldingtechniques.
Course Code: 18CMCHN2080	
Course Title: ENVIRONMENTAL SCIENCE	
CO-1	Able to know the importance of Environmental studies and the measures to be takento overcome globalenvironmental challenges.
CO-2	Able to understand the concept of ecosystem and its diversity.
CO-3	Able to gain knowledge on naturalresources.
CO-4	Able to understand the concept ofbiodiversity.
CO-5	Able to gain knowledge on environmentalpollution.
CO-6	Gain knowledge on environmental legislation andglobal treaties.

Course Outcomes for Second Year First Semester Course	
Course Code: 18CMMAT3010	
Course Title: ENGINEERING MATHEMATICS – III	
CO-1	Find the function of a complex variable
CO-2	Evaluate complex integration and expand functions using Taylor & Maclaurin‟sseries

CO-3	Evaluate integrals using Residues
CO-4	Find the statistical parameters for discrete distributions
CO-5	Find the statistical parameters for continuous distributions
CO-6	Test the hypothesis
Course Code: 18MEMET3020	
Course Title: ENGINEERING MECHANICS	
CO-1	Determine the resultant force and moment for a given system of forces
CO-2	Apply laws of friction to simple mechanisms with consideration of friction
CO-3	Draw free-body diagrams and solve statics problems
CO-4	Determine centroid and moment of inertia of simple and composite bodies
CO-5	Calculate the motion characteristics of a body subjected to a given force system
CO-6	Solve the problems using work energy method and impulse-momentum method.
Course Code: 18MEECT3030	
Course Title:BASIC ELECTRONICS ENGINEERING	
CO-1	Understand the basics of semiconductor devices and their applications.
CO-2	Describe the application using Operational amplifier.
CO-3	Discuss the working of timing circuits and oscillators.
CO-4	Understand building block of digital systems.
CO-5	Interpret different sequential circuits
CO-6	Summarize the basics of Electronic communication system.
Course Code: 18MEMET3040	
Course Title: MANUFACTURING PROCESSES	
CO-1	Recognize the different types of casting processes
CO-2	Select suitable manufacturing process for typical components.
CO-3	Describe the various welding processes.
CO-4	Analyze the processes of forging, rolling process and extrusion.
CO-5	Recognize advanced welding processes for different applications.
CO-6	Explain the concepts of Powder metallurgy and plastic processing methods
Course Code: 18MEMET3050	
Course Title: THERMODYNAMICS	
CO-1	Identify type of thermodynamic systems in the energy perspective.
CO-2	Solve the practical thermodynamic problems by applying first law and steady flowenergy equation.
CO-3	Analyze the problems on heat engines, refrigeration and entropy by applying direction of law
CO-4	Illustrate the concept of entropy by using second law of thermodynamics.

CO-5	Calculate the thermodynamic properties
CO-6	Evaluate the performance of air standard cycles and vapor power cycle and analyzethe properties of gas mixtures
Course Code: 18MEMET3060	
Course Title: MATERIALS ENGINEERING	
CO-1	Classify different bonds in solids and understand crystallization of the metals, for theformation of the solid solutions and compounds.
CO-2	Different phase diagrams and study of binary phase diagrams
CO-3	Recorgnize the property requirements of a given application and suggest suitable ferrous & nonferrous alloys
CO-4	Analyze the property requirements of a given application and suggest appropriateheat treatment
CO-5	Identified the property requirements of a given application and suggest a suitable ceramic, composite materials
CO-6	Understand the relationships between structure, composition and properties ofdifferent engineering materials
Course Code: 18MEMEL3070	
Course Title: MANUFACTURING PROCESSES LABORATORY	
CO-1	Gain the knowledge of manufacturing process.
CO-2	Know the design and manufacture of patterns for mould preparation.
CO-3	Operate arc welding, gas welding and resistance welding equipment
CO-4	Apply the practicalconcepts of TIG welding.
CO-5	Acquire fundamental knowledge on metal forming processes.
CO-6	Identify the difference between injection and blow moulding.
Course Code: 18MEMEL3080	
Course Title: COMPUTER AIDED ENGINEERING DRAWING PRACTICE LAB(CAEDP)	
CO-1	Draw orthographic projections of solids inclined to both the planes and interpenetrations of solids.
CO-2	Prepare a surface development of solids
CO-3	Identify the commands in sketching
CO-4	Describe various editing and dimensioning commands used drafting software
CO-5	Create 2D models by using various toolbars
CO-6	Reproduce solid models of various machine parts by using 3D modeling toolbars
Course Outcomes for Second Year Second Semester Course	
Course Code: 18MEMET4010	
Course Title: STRENGTH OF MATERIALS	
CO-1	Calculate stresses and strains in a member subjected to different loadings.

CO-2	Construct shear force and bending moment diagrams for beams subjected to different loads
CO-3	Compute bending stress and shear stresses of a beam
CO-4	Estimate the deflections of different beams under various loads
CO-5	Calculate the stresses in thick and thin cylindrical and spherical shells under different loads anddirections
CO-6	Distinguish the types columns and struts.
Course Code: 18MEMET4020	
Course Title: FLUID MECHANICS AND FLUID MACHINES	
CO-1	Remember the various properties of fluids and pressure measurement devices.
CO-2	Understand the kinematics and dynamics of fluids in detail.
CO-3	Estimate the losses in pipes and understand the concept of Boundary layer theory
CO-4	Solve problems on the turbo machinery using analytical method and velocitytriangles.
CO-5	Analyze the performance of hydraulic turbines, unit and specific quantities
CO-6	Analyze the working of hydraulic pumps and their performance curves
Course Code: 18MEMET4030	
Course Title: THEORY OF MACHINES – I	
CO-1	Explain the importance of kinematics, kinematic pairs and mechanisms
CO-2	Describe the relative motion between the parts of a mechanism without considering the forces.
CO-3	Summarize various mechanisms for straight line motion and steering gear, Hooke'sjoint with applications.
CO-4	Analyse the velocity and acceleration concepts for four bar mechanism & slider crank mechanism using graphical method
CO-5	Distinguish types of cam mechanisms and draw the cam profile for different followermotions
CO-6	Calculate length of contact, arc of contact and minimum number of teeth to avoidinterference. Also calculate speeds of different gears in a gear train.
Course Code: 18MEMET4040	
Course Title: APPLIED THERMODYNAMICS	
CO-1	Calculate stoichiometric air fuel ratio, excess air and the properties of psychrometry.
CO-2	Determine the methods of improving rankine cycle efficiency and design the constructional features of various types of boilers.
CO-3	Evaluate critical pressure and other properties of steam in a steam nozzle.
CO-4	Compute the efficiency of steam turbines through graphical and analytical methods.
CO-5	Analyze, compare simple and modified Brayton cycles.
CO-6	Estimate the performance of different types of compressors.
Course Code: 18CMMST4050	
Course Title: ENGINEERING ECONOMICS AND FINANCIAL MANAGEMENT	
CO-1	Equipped with the knowledge of managerial economics and estimating demand for aproduct.
CO-2	Examine the Production Concept and familiar with the concepts of iso-quants, iso- cost lines and MRTS
CO-3	Predict the cost of production and its relevance to managerial decision making

CO-4	Differentiate various the Markets and Pricing methods along with Business Cycles.
CO-5	Prepare Financial Statements along with Analysis
CO-6	Analyse and interpret various investment project proposals with the help of Capital Budgeting techniques.
Course Code: 18MEMEL4060	
Course Title: FLUID MECHANICS & FLUID MACHINES LAB	
CO-1	Calculate the coefficient of discharge of various fluids
CO-2	Evaluate the flow of fluids in closed channels
CO-3	Solve the flow of fluids in open channels
CO-4	Test the impact of jet on vanes
CO-5	Analyze the working of hydraulic turbines and their performance curves
CO-6	Estimate the performance of hydraulic pumps
Course Code: 18MEMEL4070	
Course Title: MECHANICS OF SOLIDS & MATERIALS LAB	
CO-1	Compute the strength of members of various materials under different loads such as compressive, tensile, flexural and torsional.
CO-2	Compute the elastic property of the beam material by measuring deflection
CO-3	Determine the hardness of different types of materials
CO-4	Measure the stiffness of a spring
CO-5	Determine the modulus of rigidity of a shaft
CO-6	Identify a suitable ferrous and non- ferrous metal and their alloys for a givenapplication
CO-7	Suggest appropriate heat treatment for a given application
CO-8	Relate the hardenability of steels by jominy end quench test with jominy Distances
Course Code: 18MEMEN4080	
Course Title: MACHINE DRAWING	
CO-1	Identify the national and international standards pertaining to machine drawing.
CO-2	Illustrate various machine components through drawings.
CO-3	Construct an assembly drawing of a machine unit
CO-4	Interpret a set of working drawings of a machine assembly including detail drawings,bill of materials, part specifications
CO-5	Analyze the part or assembly drawings as per the conventions.
CO-6	Understanding the importance of the linking functional and visualization aspects inthe preparation of the part drawings
Course Outcomes for Third Year First Semester Course	
Course Code: 18CMBIT5010	
Course Title: BIOLOGY FOR ENGINEERS	
CO-1	Describe how biological observations of 18th Century that lead to major discoveries.
CO-2	Convey that classification per se is not what biology is all about but highlight theunderlying criteria, such as morphological, biochemical, and ecological
CO-3	Highlight the concepts of recessiveness and dominance during the passage of geneticmaterial from parent to offspring

CO-4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO-5	Classify enzymes and distinguish between different mechanisms of enzyme action.
CO-6	Convey that "Genetics is to biology what Newton's laws are to Physical Sciences"
Course Code: 18MEMET5020	
Course Title: MANUFACTURING TECHNOLOGY	
CO-1	Analyze mechanics of orthogonal cutting to metal machining.
CO-2	Operate lathe, shaping, slotting, planning, drilling, milling, grinding and CNCmachines.
CO-3	Select cutting tool materials and tool geometries for different metals
CO-4	Apply working principles of CNC Machines.
CO-5	Design tolerances and fits for a given applications.
CO-6	Outline different instruments used in metrology.
Course Code: 18MEMET5030	
Course Title: DESIGN OF MACHINE ELEMENTS	
CO-1	Identify the customers' need, formulate the problem and to observe the behaviour ofcomponent subjected to loads
CO-2	Assess the different types of failure modes and criteria.
CO-3	Define fluctuating stresses, endurance limit and fatigue failure
CO-4	Analyse permanent joints (riveted, welded, etc.) under concentric and eccentric
	loading conditions
CO-5	Analyse detachable joints (bolts, cotters, etc.) under various loading conditions.
CO-6	Evaluate stiffness, number of coils and length etc., of coil springs (compression,tension, torsion) under various loads.
Course Code: 18MEMET5040	
Course Title: HEAT TRANSFER	
CO-1	Explain basic modes of heat transfer and compute temperature distribution in steadystate and unsteady state heat conduction
CO-2	Analyze heat transfer through extended surfaces
CO-3	Interpret and analyze free & forced convection heat transfer
CO-4	Comprehend the phenomena and flow regimes of boiling and condensation
CO-5	Explain the principles of radiation heat transfer
CO-6	Apply LMTD and NTU methods to design heat exchangers
Course Code: 18MEMEL5060	
Course Title: HEAT TRANSFER LAB	
CO-1	Find thermal conductivity of different common metallic materials
CO-2	Find the quantity of heat transfer between fluids and solid boundaries
CO-3	Evaluate the amount of heat exchanged between fluids flowing within heatexchangers
CO-4	Explain simple experimental work in radiative heat transfer
CO-5	Analyze different heat exchangers

CO-6	Design heat exchangers
Course Code: 18MEMEL5070	
Course Title: MANUFACTURING AND METROLOGY LAB	
CO-1	Acquire the knowledge of manufacturing processes.
CO-2	Conduct experiments to understand the mechanism of chip formation.
CO-3	Analyze various cutting parameters in different machining operations.
CO-4	Operate different machine tools.
CO-5	Apply the knowledge of different instruments for linear and angular measurements.
CO-6	Choose the appropriate measuring instrument for a specific requirement
Course Outcomes for Third Year Second Semester Course	
Course Code: 18MEMET6010	
Course Title: Theory of Machines-II	
CO-1	Analyze the effects of gyroscopic forces and torques acting on moving bodies and predict their behaviour.
CO-2	Determine the frictional torque developed in rotating parts like clutches, brakes anddynamometers.
CO-3	Appraise the dynamic forces and torques developed in the rotating parts like cranks and flywheels and sketch the turning moment diagrams.
CO-4	Describe the working principles of different governors and choose their applications.
CO-5	Develop the solutions for the unbalanced forces and torques occurring in the rotatingand reciprocating parts of an engine.
CO-6	Distinguish the types of vibrations occurring in machine parts and judge their effects.
Course Code: 18CMEGT6020	
Course Title: Personality Development &Professional Communication	
CO-1	Understand Personality development process and learn to implement effective techniques.
CO-2	Understand how people behave and regulate self behaviours and learn to work in ateam.
CO-3	Know their career values, indentify their skills, set goals for enhancing their career skills
CO-4	Understand and learn how to deal with problems and practice problem solving skills.
CO-5	Learn the principles of professional communication & application of the same
CO-6	Face job interviews confidently and work a team effectively
Course Code: 18MEMEL6060	
Course Title: THEORY OF MACHINES LABORATORY	
CO-1	Compare the whirling speed of the shaft theoretically and experimentally
CO-2	Compute frictional torque transmitted by the mechanical components.
CO-3	Demonstrate balancing of reciprocating and rotary masses.
CO-4	Determine the natural frequencies of continuous systems.
CO-5	Analyze stabilization of sea vessels, aeroplanes and automobile vehicles
CO-6	Plot the cam Profile for different cam follower systems.
Course Code: 18MEMEL6070	

Course Title: THERMAL ENGINEERINGLABORATORY	
CO-1	Sketch the valve timing diagram and port timing diagram for single cylinder four stroke diesel engine and two stroke petrol engine
CO-2	Conduct constant speed and variable speed tests on IC engines and interpret theirperformance.
CO-3	Estimate energy distribution by conducting heat balance test on IC engines
CO-4	Calculate the mechanical efficiency of four stroke SI engine by Morse test.
CO-5	Examine the performance testing of variable compression ratio petrol engine.
CO-6	Measure the fuel properties of various fuels used in IC engines.
Course Code: 18MEMEL6080	
Course Title: MODELLING & SIMULATION LABORATORY	
CO-1	Identify the various sketch and part design tools in modeling software
CO-2	Draw machine components by modeling software
CO-3	Apply the knowledge of 3D & assembly drawing
CO-4	Solve 2D structural and axi-symmetric problems using analysis software
CO-5	Compute heat transfer problems using analysis software
CO-6	Prepare part programme for engineering components on CNC Machining center
Course Code: 18MEMEN6090	
Course Title: DESIGN OF TRANSMISSION SYSTEMS	
CO-1	Analyze the pressure distribution in journal bearings
CO-2	Compute design parameters of engine components such as cylinder, piston,connecting rod and crankshaft
CO-3	Analyze shafts and couplings with different geometrical features under various loading conditions
CO-4	Calculate geometrical relations for length of belt and chain
CO-5	Idetnify types of pulleys/sprockets for belt and chain drives from manufacture's catalogue
CO-6	Learned calculation procedure for beam strength and wear strength, effective loadand module based on beam strength.
ELECTIVE-I	
Course Code: 18MEMEP603A	
Course Title: COMPOSITE MATERIALS	
CO-1	Obtain knowledge on classification, processing, characterization and applications ofcomposite materials.
CO-2	Analyze mechanical properties and failure mechanisms of composites under different loading conditions for engineering applications
CO-3	Outline the composite material strength and its mechanical behavior, and designdifferent combinations of plies with different orientations of the fiber
CO-4	Obtain knowledge on classification, processing, characterization and applications ofcomposite materials.
CO-5	Analyze mechanical properties and failure mechanisms of composites under different loading conditions for engineering applications
CO-6	Outline the composite material strength and its mechanical behavior, and designdifferent combinations of plies with different orientations of the fiber
CO-7	Analyze different types of advanced composite materials
CO-8	Apply various techniques to design laminates

CO-9	Summarize the composite materials under desired conditions and specifications.
Course Code: 18MEMEP603B	
Course Title: UNCONVENTIONAL MACHINING PROCESSES	
CO-1	Differentiate Conventional and Non-Conventional machining and analyze thedifferent elements of Abrasive jet Machining and its applications.
CO-2	Analyze the working principle and applications of water jet and ultrasonic machiningprocesses.
CO-3	Describe the mechanism and applications of various Electro-Chemical Machiningprocesses
CO-4	Apply the knowledge of mechanics of material removal of EDM, EBM and LBM processes
CO-5	Explain the principle of PAM and applications of plasma in manufacturingindustries.
CO-6	Analyze the mechanism of material removal in finishing processes
Course Code: 18MEMEP603C	
Course Title: INTERNAL COMBUSTION ENGINES	
CO-1	Analyze the Air Standard Cycles, Fuel Air Cycles and Actual Cycles
CO-2	Explain various internal combustion engines working principles and analyze variousengine systems.
CO-3	Illustrate various combustion processes and design of combustion chambers in S.I. engines.
CO-4	Describe various combustion processes and design of combustion chambers in C.I.engines
CO-5	Evaluate the performance parameters of I.C. Engines.
CO-6	Outline the emission measuring techniques and various alternate fuels.
ELECTIVE-II	
Course Code: 18MEMEP604A	
Course Title: POWER PLANT ENGINEERING	
CO-1	List, describe the main sources of energy, including those that are currently used andthose that may be used in future
CO-2	Describe the functions of the major equipment and auxiliaries of a steam power plant
CO-3	Identify, demonstrate the components of a IC Engine power plant and Gas Turbinepower plants and describe the functions of the major equipment and auxiliaries of ahydro power plant.
CO-4	Explain the basic principles of nuclear reactions and Explain working principle of different types of nuclear power plants.
CO-5	Explain the working principles of Non-Conventional power plants
CO-6	Determine performance of power plants based on load variations and Analyze economics of power plants based on factors affecting the power plants
Course Code: 18MEMEP604B	
Course Title: CAD/CAM	
CO-1	Execute the fundamentals of CAD/CAM, Computer graphics and transformation geometry.
CO-2	Develop the mathematical models to represent curves and surfaces.
CO-3	Model the engineering components using solid modelling techniques.
CO-4	Create CNC program and APT language to manufacture industrial components
CO-5	Explain the elements of an automated manufacturing environment

CO-6	Analyze the overall configuration and elements of computer integratedmanufacturing systems.
Course Code: 18MEMEP604C	
Course Title: DESIGN FOR MANUFACTURE	
CO-1	Understand the basic principles of design for manufacturing and assembly
CO-2	Implement the design principles for manufacturing processes
CO-3	Apply the casting design for the best casting process to a product.
CO-4	Design components for various machines used in the manufacturing process
CO-5	Implement the design rules for machining with single point and multi point cuttingtools.
CO-6	Identify the differences between the design for manual assembly and automatedassembly.
Course Outcomes for Fourth Year First Semester Course	
Course Code: 18MEMET7010	
Course Title: OPERATIONS RESEARCH	
CO-1	**Formulate** and solve mathematical model (linear programming problem) for aphysical situations like production and distribution of goods.
CO-2	**Apply** the concept of simplex method and its extensions to dual simplex algorithm.
CO-3	**Solve** the problem of transporting the products from origins to destinations with leasttransportation cost.
CO-4	**Convert** and **solve** the practical situations of sequencing and replacement problem.
CO-5	**Identify** the resources required for a project and generate a plan and work schedule.
Course Code: 18MEMET7020	
Course Title: INSTRUMENTATION & CONTROL SYSTEMS	
CO-1	Criticize the methods of measurement techniques and describes the errors of theinstruments
CO-2	Describe the importance of displacement measuring instruments.
CO-3	Describe and distinguish between the temperature and pressure measuringinstruments
CO-4	Demonstrate which is the suitable instrument is required to measure the variables.
CO-5	Subdivide the various types of stress strain measuring gauges and Demonstrate thevarious performance characteristics of force, torque and power measuring devices
CO-6	Differentiate and importance of open and closed loop control systems in instrument and Demonstrate the various PI, PID controls and programmable logic controls.
ELECTIVE-III	
Course Code: 18MEMEP703A	
Course Title: Gas Dynamics & Jet Propulsion	
CO-1	Solve flow equations for quasi one dimensional flow through variable area ducts.
CO-2	Analyze the flow through constant area ducts with friction and heat transfer.
CO-3	Analyze flows with normal and oblique shocks.
CO-4	Solve flow problems with supersonic velocities using shock-expansion theory,linearized velocity potential equation for multi dimensional flows.

CO-5	Analyze the performance of tubro propeller engines, basic theory of equations-thrust, effective jet velocity.
Course Code: 18MEMEP703B	
Course Title: FINITE ELEMENT METHODS	
CO-1	Identify and formulate different stress and strain relations, displacement relations ona particular object using FEM methods.
CO-2	Apply and solve different element shapes using stiffness matrix
CO-3	Distinguish between the analysis of trusses and beams
CO-4	Analyze a finite element modeling problems of two dimensional stress by constantstrain triangles
CO-5	Apply one dimensional quadratic equation on iso parametric elements and numerical integrations.
CO-6	Perform dynamic analysis of finite element models.
Course Code: 18MEMEP703C	
Course Title: FLEXIBLE MANUFACTURING SYSTEMS	
CO-1	Identify and distinguish FMS with other manufacturing systems including job- shop and mass production systems.
CO-2	Explain processing stations and material handling system used in FMSenvironments.
CO-3	Design and analyze FMS using simulation and analytical techniques.
CO-4	Understand tool management in FMS.
CO-5	Analyze the production management problems in planning, loading, scheduling, routing and breakdown in a typical FMS.
ELECTIVE-IV	
Course Code: 18MEMEP704A	
Course Title: AUTOMOBILE ENGINEERING	
CO-1	Understand the basic lay-out of an automobile.
CO-2	Understand the operation of engine cooling, lubrication, ignition, electrical and airconditioning systems.
CO-3	Understand the principles of transmission, suspension, steering and braking systems.
CO-4	Understand automotive restraint system.
CO-5	Study latest developments in automobiles.
Course Code: 18MEMEP704B	
Course Title: MECHATRONICS	
CO-1	Model, analyze and control engineering systems.
CO-2	Identify sensors, transducers and actuators to monitor and control the behavior of aprocess or product.
CO-3	Identify Hydraulic and pneumatic actuating systems.
CO-4	Evaluate the performance of mechatronic systems.
CO-5	Apply the use of micro-mechatronic systems in various fields& case studies.
Course Code: 18MEMEP704C	
Course Title: AUTOMATION IN MANUFACTURING	
CO-1	Illustrate the basic concepts of automation in machine tools.
CO-2	Analyze various automated flow lines.

CO-3	Explain assembly systems and line balancing methods.
CO-4	Describe the importance of automated material handling and storage systems.
CO-5	Interpret the importance of adaptive control systems, automated inspection systems.
ELECTIVE-V	
Course Code: 18MEMEP802A	
Course Title: ENERGY CONSERVATION AND MANAGEMENT	
CO-1	Understand the World Energy scenario
CO-2	Explain the importance of effective energy conservation and management
CO-3	Implement various energy management programs in commercial and industrial areas.
CO-4	Identify cost effective solutions to various existing energy systems
CO-5	Assess electric bills for cost saving
CO-6	Understand the working principle of few important basic thermal systems
Course Code: 18MEMEP802B	
Course Title: NON-DESTRUCTIVE EVALUATION	
CO-1	Understand the techniques of non-destructive testing.
CO-2	Apply methods of non-destructive testing to evaluate products of railways,automobiles, aircrafts, chemical industries, etc.
CO-3	Apply basic principles of these methods and to be able to select a testing process.
CO-4	Apply the concepts of various NDE techniques like radiographic testing, ultrasonic testing, liquid penetrant testing, magnetic particles testing and eddy current testing.
CO-5	Understand the advantages and disadvantages of these techniques.
Course Code: 18MEMEP802C	
Course Title: SOLID MECHANICS	
CO-1	To learn the method of calculating stress and strain in a member subjected to principal stress and strain and relation between them.
CO-2	To understand the relation between elastic constants and material symmetry.
CO-3	To analyze the theories of failures and bending of beams.
CO-4	To calculate the torsion of a circular, elliptical, triangular, rectangular bars, andRolled sections.
CO-5	To calculate the stress energy stored by using different energy methods.
ELECTIVE-VI	
Course Code: 18MEMEP803A	
Course Title: REFRIGERATION & AIR CONDITIONING	
CO-1	Resolve the forces into components, moment of force and its applications
CO-2	Construct free body diagrams and develop appropriate equilibrium equations.
CO-3	Determine centroid and moment of inertia for composite areas.
CO-4	Determine the kinematic relations of particles & rigid bodies.
CO-5	Apply equations of motion to particle and rigid body.

CO-6	Analyze motion of particles & rigid bodies using the principle of energy andmomentum methods.
Course Code: 18MEMEP803B	
Course Title: COMPUTATIONAL FLUID DYNAMICS	
CO-1	**Gain knowledge** on basics of numerical methods and its applications.
CO-2	**Apply** numerical techniques for solving various engineering problems involvingfluid flow and heat transfer.
CO-3	**Solve** governing equations using FDM.
CO-4	**Gain knowledge** about discretization, stability and consistency of the fluid flow andheat transfer equations.
CO-5	**Evaluate** various partial differential equations using various numerical schemes.
CO-6	**Solve** governing equations using FVM.
Course Code: 18MEMEP803C	
Course Title: QUALITY & RELIABILITY ENGINEERING	
CO-1	Understand the approaches and techniques and techniques to assess and improve process and/or product quality and reliability
CO-2	Use techniques of Statistical Quality Control and their practical uses in productand/or process design and monitoring
CO-3	Describe different sampling plans.
CO-4	Acquire basic knowledge of tools and techniques of TQM in manufacturing andservice sectors
CO-5	Apply techniques of modern reliability engineering.
Course Outcomes for Fourth Year Second Semester Course	
Course Code: 18MEMER805X	
Course Title: Project Phase-II	
CO1	After completing the project work the student should learn the technical procedure of planning, scheduling, and realizing an engineering product and further acquire theskills of technical report writing and data collection.
OPEN ELECTIVE OFFERED BY MECHANICAL ENGINEERING	
Course Code: 18XXMEOM0NA	
Course Title: OPERATIONS RESEARCH	
CO-1	**Formulate** and solve mathematical model (linear programming problem) for real situations like production and distribution of goods.
CO-2	**Apply** the concept of simplex method and dual simplex algorithm to solve decision-making linear programming problems.
CO-3	Build transportation models and assignment models to carry out sensitivity analysis.
CO-4	**Solve the problems of** competitive business world using Sequencing problemand queuing theory **techniques.**
CO-5	Identify the inventory and game theory problems in business world.
CO-6	Classify optimization problems in real world and apply appropriate OR techniques
Course Code: 18XXMEOM0NB	
Course Title: ROBOTICS	
CO-1	Identify various robot configurations and components
CO-2	Select appropriate actuators and sensors for a robot based on specific application.
CO-3	Carry out kinematic and dynamic analysis for simple kinematic chains.

CO-4	Analyze forces in links and joints of a robot.
CO-5	Perform trajectory planning for a robot manipulator
CO-6	Explain the specific applications of a robot in industry.
Course Code: 18XXMEOM0NC	
Course Title: Advanced Optimization Techniques	
CO-1	Formulate and solve linear Programming Problems
CO-2	Determine the optimum solution to constrained and unconstrained
CO-3	Use Numerical Methods to Optimize the industrial problems
CO-4	Solve various GA problems
CO-5	Determine inventory and queuing problems using Simulation techniques
CO-6	Identify optimization problems in real world and apply appropriate OR techniques
Course Code: 18XXMEOM0ND	
Course Title: GREEN ENGINEERING SYSTEMS	
CO-1	Explain the principles, applications and uses of non conventional energy resources.
CO-2	Apply the basic principles of conversion technologies of nonconventional energy resources in to electric power.
CO-3	Develop energy efficient systems
CO-4	Demonstrate the concepts of energy efficient process
CO-5	Outline features of an green buildings
Course Code: 18XXMEOM0NE	
Course Title: PRODUCTION PLANNING AND CONTROL	
CO-1	Illustrate the systems concept for the design of production and service systems.
CO-2	Explain the elements of Production Planning and control and discuss the role ofinternal organization
CO-3	Develop forecasts in the manufacturing and service sectors using selected quantitative and qualitative techniques
CO-4	Discuss the importance and function of inventory and to be able to apply selected techniques for its control and management under dependent and independent demandcircumstances.
CO-5	Select and use an appropriate principles/methods/ techniques/ modern concepts with reference to given application/situation in the preparation of route sheets withscheduling and loading in manufacturing systems.
CO-6	Create and engage in life-long learning in the context of technological change in Operations Management and also able to identify dispatching, follow-up activities inthe system
Course Code: 18XXMEOM0NF	
Course Title: NANOTECHNOLOGY	
CO-1	Explain the importance of Nanotechnology & its emergence in various fields
CO-2	Identify various properties of nano materials in different applications.
CO-3	Select manufacturing methods, techniques and process parameters for processing ofnano materials.
CO-4	Evaluate the properties of nano materials using different characterization tools&equipments.

CO-5	Apply the concept of carbon allotropes in Nano Technology industrial applications.
CO-6	Analyze the properties of nano materials in various applications

Department of Mechanical Engineering
SITE 21 Regulation Course Outcomes

Course Outcomes for First Year First Semester Course	
Course Code: 21CMMAT1010	
Course Title: Engineering Mathematics – I	
CO-1	Solve the differential equations related to various engineering fields
CO-2	Solve the differential equations of higher order related to various engineeringfields
CO-3	Familiarize with functions of several variables which is useful in optimization
CO-4	Solve the partial partial differential equations of first order
CO-5	Apply double integration techniques in evaluating areas bounded by region
Course Code: 21CEPHT1020 & 21MEPHT1020	
Course Title: ENGINEERING PHYSICS	
CO-1	Distinguish the various harmonic motions and resonance.
CO-2	Apply Newton's law of motion to understand the motions of mechanical systems.
CO-3	Verify the invariance of Newton's equation of motion.
CO-4	Understand the concept of conservative and non-conservative motions.
CO-5	Formulate the rigid body dynamics.
CO-6	Study the structure- elastic property correlation under load within the elastic limits.
Course Code: 21CMCHT1030/2030	
Course Title: ENGINEERING CHEMISTRY	
CO-1	Interpret the mechanism of corrosion
CO-2	Summarize the problems faced in industries due to boiler troubles.
CO-3	Recall the properties and applications of advanced materials.
CO-4	Summarize the advantages of non-conventional energy resources and batteries.
CO-5	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used for exciting different molecular energy levels.
CO-6	Determine the strength of acid, base and some elements by volumetric and instrumental analysis.
Course Code: 21CMCST1040	
Course Title: PROGRAMMING FOR PROBLEM SOLVING	
CO-1	Demonstrate computer components, algorithms, translate them into programs.
CO-2	Choose the suitable control structures for the problem to be solved.
CO-3	Make use of arrays, pointers, structures, and unions effectively.
CO-4	Organize reusable code in a program into functions.
CO-5	Demonstration of file operations.
Course Code: 21CMMEL1050	
Course Title: ENGINEERING GRAPHICS	

CO-1	Construct polygons, scales and engineering curves
CO-2	Draw the orthographic views of points, lines and planes
CO-3	Construct the projections of regular and irregular polyhedrons
CO-4	Draw the sectional views of solids
CO-5	Draw isometric/orthographic views using AutoCAD
Course Code: 21MEPHL1060 & 21CEPHL1060	
Course Title: ENGINEERING PHYSICS LAB	
CO-1	Compare the theory and correlated with experiments
CO-2	Design experiments
CO-3	Analyze the experimental result
CO-4	Apply appropriate techniques to perform the experiments
CO-5	Apply the knowledge in simple harmonic motions and resonance to understand therigid body dynamics.
CO-6	Verify the parallel axis and perpendicular theorems of moment of inertia.
Course Code: 21CMCSL1080	
Course Title: PROGRAMMING FOR PROBLEM SOLVING LAB	
CO-1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solvingproblems.
CO-2	Examine and analyze alternative solutions to a problem.
CO-3	Design an algorithmic solution to a problem using problem decomposition andstep- wise refinement.
CO-4	Demonstrate conversion of iterative functions to recursive and vice-versa.
CO-5	Implement the concepts of arrays, structures, Unions and files.
Course Code: 21CMMSN1090	
Course Title: CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMANRIGHTS	
CO-1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
CO-2	Understand state and central policies, fundamental duties.
CO-3	Understand Electoral Process, special provisions.
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operativeSocieties, and
CO-5	Understand Engineering ethics and responsibilities of Engineers
Course Outcomes for First Year Second Semester Course	
Course Code: 21CMEGT 1010/2010	
Course Title: TECHNICAL ENGLISH	
CO-1	Ability to understand Scientific vocabulary and use them confidently
CO-2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO-3	Ability to write error free simple technical passages
CO-4	Knowledge of writing different writing styles
CO-5	Confidence to write letters and technical reports clearly and coherently
Course Code:21CMMAT2020	

Course Title: ENGINEERING MATHEMATICS-II	
CO-1	Develop the use of matrix algebra techniques that is needed by engineers forpractical applications and solve system of linear equations
CO-2	Find the inverse and power of a matrix by Cayley-Hamilton theorem and reducethe Quadratic form
CO-3	Solve initial value problems by using Laplace transforms
CO-4	Find the solution of algebraic/ transcendental equations and also interpolate the functions
CO-5	Apply different algorithms for approximating the solutions of ordinary differentialequations with initial conditions to its analytical computations .
Course Code: 21CMEET1030/2030	
Course Title: BASIC ELECTRICAL ENGINEERING	
CO-1	Understand basic electrical circuit operation.
CO-2	Understand the concept of Alternating Voltage and Current.
CO-3	Understand the operation of DC machines.
CO-4	Understand the working of measuring instruments.
CO-5	Understand the operation of different types of ac machines.
CO-6	Understand the concept of Electrical Safety.
Course Code: 21CMCST2040	
Course Title: PYTHON PROGRAMMING	
CO-1	Explain the fundamental concepts in the Python language.
CO-2	Implementation of python iterative statements and strings.
CO-3	Demonstrate python lists, dictionaries, and functions.
CO-4	Understand the concepts of modules and packages in python.
CO-5	Complete coding challenges related to object-oriented programming.
CO-6	Apply variety of error handling and GUI programming techniques.
Course Code: 21CMMET2050	
Course Title: ENGINEERING MECHANICS	
CO-1	determine resultant force and moment for different force systems.
CO-2	analyse the rigid bodies associated with frictional forces using conditions ofequilibrium
CO-3	locate the centroid / center of gravity and determine the moment of inertia of planesections/solids.
CO-4	understand the behaviour of moving bodies in rectilinear motion and solvekinematic equations of motion curves.
CO-5	solve the problem using work energy method and impulse momentum method.
Course Code: 21CMEGL1050/2050	
Course Title: ENGLISH & COMMUNICATION SKILLS LAB	
CO-1	Listening Comprehension
CO-2	Pronunciation
CO-3	Dialogues
CO-4	Interpersonal Communication Skills

CO-5	Presentations

Course Code: 21CMEEL1070/2070	
Course Title: BASIC ELECTRICAL ENGINEERING LABORATORY	
CO-1	Verify the Kirchoff's laws.
CO-2	Verify network theorems for a given circuit.
CO-3	Control the speed of DC motor.
CO-4	Analyze performance of single-phase induction motor
CO-5	Analyze performance of three phase induction motor.
CO-6	Identify different types of earthings
Course Code: 21CMMEL2080	
Course Title: WORKSHOP PRACTISE LABORATORY	
CO-1	Perform the joinery work of wooden pieces using carpentry.
CO-2	Perform the joinery work of metallic pieces using fitting.
CO-3	Produce the required shaped metallic products using black smithy.
CO-4	Make the green sand moulds using different patterns
CO-5	Fabricate different components using welding.
Course Code: 21CMCHN1090/2090	
Course Title: ENVIRONMENTAL SCIENCE	
CO-1	Obtain knowledge on global warming & climate change - Acid rains, ozone layerdepletion.
CO-2	Preserve several natural resources
CO-3	Summarize the concept of ecosystem
CO-4	Control different types of pollution
CO-5	Understand social issues and environmental legislation
Course Outcomes for Second Year Third Semester Course	
Course Code: 21CMMAT3010/20	
Course Title: ENGINEERING MATHEMATICS-III	
CO-1	Interpret the physical meaning of different operators such as gradient, curl anddivergence
CO-2	Estimate the work done against a field, and verify integral theorems
CO-3	Apply Cauchy-Riemann equations to complex functions in order to determinewhether a given continuous function is analytic
CO-4	Find the differentiation and integration of complex functions used in engineeringproblems
CO-5	Make use of the Cauchy residue theorem to evaluate certain integrals
Course Code: 21MEMET3020	
Course Title: MATERIALS ENGINEERING	
CO-1	Understand the basic crystal structures and their relationship with the properties

CO-2	Identify the phases, present in different alloy systems by analyzing the phasediagrams
CO-3	Understand the structure and properties of cast iron and nonferrous metals andalloys
CO-4	Analyze various heat treatment process to change in physical properties in metals
CO-5	Student is able to Know the structure and properties of different polymers, ceramicand composite materials
Course Code: 21MEMET3030	
Course Title: MECHANICS OF SOLIDS	
CO-1	Estimate the stress and strain developed in any structural member due to appliedexternal load.
CO-2	Analyze the principal stress and principal strain at a point of a stressed members and draw shear force diagram and bending moment diagram for different types ofbeams under various loading and support conditions
CO-3	Analyze shear stress distribution in solid members and calculate section modulus for various beam cross-sections
CO-4	Calculate the slope, deflection and torsion at a specified point of a beam underdifferent loads
CO-5	Analyze thin and thick cylinders under different boundary conditions
Course Code: 21MEMET3040	
Course Title: THERMODYNAMICS	
CO-1	Identify type of thermodynamic systems in the energy perspective.
CO-2	Solve the practical thermodynamic problems by applying first law and steady flowenergy equation.
CO-3	Analyze the problems on heat engines, refrigeration, and entropy by applying direction of second law and illustrate the concept of entropy by using second law of thermodynamics.
CO-4	Calculate the thermodynamic properties of the pure substances.
CO-5	Measure the performance of air standard cycles and vapor power cycle and analyzethe properties of gas mixtures.
Course Code: 21MEMET3050	
Course Title: FLUID MECHANICS AND FLUID MACHINES	
CO-1	Demonstrate various properties of fluids, pressure measurement devices and theirapplications.
CO-2	Identify the kinematics and dynamics properties of fluids flowing in differentconditions and its effects on the bodies.
CO-3	Estimate the effect of various losses in fluids due to flowing and obstructionsunderstand using the concepts of pipe losses and Boundary layer theory.
CO-4	Analyze the performance of hydraulic turbines, unit and specific quantities based on the design by applying the knowledge of turbo machinery using analyticalmethods and velocity triangles.
CO-5	Analyze the performance of various hydraulic pumps based on workings anddesign.
Course Code: 21MEMEL3060	
Course Title: MECHANICS OF SOLIDS & MATERIALS LAB	
CO-1	Conduct Tensile and compression test using Universal Testing Machine
CO-2	Calculate Modulus of rigidity and stiffness of the spring using tensile spring testerand Torsion tester

CO-3	Determine the impact resistance of the given material using Impact tester
CO-4	Find the RHN & BHN using Rockwell and Brinell Hardness testers
CO-5	Identify different metallographic structures of different ferrous alloys
Course Code: 21MEMEL3070	
Course Title: FLUID MECHANICS & MACHINES LAB	
CO-1	Calculate different parameters such as coefficient of discharge, coefficient of impact, power, efficiency, etc. of various experiments.
CO-2	Estimate pressure variation in a flowing fluid using Bernoulli's principle applications such as Venturi meter, Orifice meter.
CO-3	Compute the head losses in various diameter pipes.
CO-4	Calculate different parameters such as coefficient of impact.
CO-5	Analyze the working of hydraulic turbines and pumps their performance curves.
Course Code: 21MEMES3080	
Course Title: COMPUTER AIDED ENGINEERING DRAWING AND DRAFTING	
CO-1	Understand skills in engineering drawing and to introduce drafting packages andcommands for computer aided drawing and modeling
CO-2	Utilize various commands in AutoCAD to draw the geometric entities and to create 2D wire frame models.
CO-3	Interpret various commands in AutoCAD to draw the geometric entities and tocreate 3D wire frame models
CO-4	Construct geometrical model of simple solids, machines & machine parts
CO-5	Understand view points and view ports, view point coordinates and viewsdisplayed and develop computer aided solid models with isometric and orthographic projections.
Course Code: 18MEECM3090	
Course Title: BASIC ELECTRONIC ENGINEERING	
CO-1	Understand the basics of semiconductor devices and their applications.
CO-2	Describe the application using Operational amplifier.
CO-3	Discuss the working of timing circuits and oscillators.
CO-4	Understand building block of digital systems.
CO-5	Summarize the basics of Electronic communication system.
Course Outcomes for Second Year Fourth Semester Course	
Course Code: 21CMMAT4010/20	
Course Title: ENGINEERING MATHEMATICS-IV	
CO-1	Find the Fourier series of a periodic functions (L3)
CO-2	Identify solution methods for partial differential equations that model physicalprocesses (L3).
CO-3	Apply the Concepts of Probability and Find the statistical Parameters of Discrete and Continuous distributions (L3)

CO-4	Estimate the properties of population from samples. (L5)
CO-5	Design the Components of classical Hypothesis test, Conclude the statisticalinferential methods based on small and large samples. (L6)
Course Code: 21MEMET4020	
Course Title: APPLIED THERMODYNAMICS	
CO-1	Explain various internal combustion engines working principles and analyze various engine systems.
CO-2	Determine the methods of improving Rankine cycle efficiency and design theconstructional features of various types of boilers.
CO-3	Evaluate critical pressure and other properties of steam in a steam nozzle.
CO-4	Compute the efficiency of steam turbines through graphical and analyticalmethods.
CO-5	Analyze, compare simple and modified Brayton cycles and estimate theperformance of different types of compressors.
Course Code: 21MEMET4030	
Course Title: DESIGN OF MACHINE ELEMENTS-I	
CO-1	Identify the customers' need, formulate the problem and different types of failure modes and criteria to observe the behavior of component subjected to loads.
CO-2	Define fluctuating stresses, endurance limit and fatigue failure.
CO-3	Analyze permanent joints (riveted, welded, etc.) under concentric and eccentricloading conditions.
CO-4	Analyze detachable joints (bolts, cotters, etc.) under various loading conditions.
CO-5	Evaluate stiffness, number of coils and length etc., of coil springs (compression,tension, torsion) under various loads.
Course Code: 21MEMET4040	
Course Title: PRODUCTION TECHNOLOGY	
CO-1	Students able to understand the knowledge of various casting processes
CO-2	Students should be able to identify various casting technique parameters and theirdesign effect on processes.
CO-3	Students should be able to understand the equipment to complete specified welding processes efficiently and correctly
CO-4	Students should be able to apply knowledge of welding safety standards to bothfield and factory environments.
CO-5	Students should be able to understand the metal forming and sheet metal formingprocesses and their relevance in current manufacturing industry
CO-6	
Course Code: 21MEMET4050	
Course Title: KINEMATICS OF MACHINERY	
CO-1	To understand the relative motions of different kinematic mechanisms
CO-2	To evaluate different straight line motion mechanisms and steering gearmechanisms
CO-3	To determine the velocity and acceleration using IC, velocity methods
CO-4	To draw the profiles of cams and followers
CO-5	To know the methodology of gears and its transmission

Course Code: 18CMMST4050	
Course Title: ENGINEERING ECONOMICS AND FINANCIAL MANAGEMENT	
CO-1	Equipped with the knowledge of managerial economics and estimating demand fora product.
CO-2	Examine the Production Concept and familiar with the concepts of iso-quants, iso-cost lines and MRTS
CO-3	Predict the cost of production and its relevance to managerial decision making
CO-4	Differentiate various the Markets and Pricing methods along with Business Cycles.
CO-5	Prepare Financial Statements along with Analysis
CO-6	Analyse and interpret various investment project proposals with the help of CapitalBudgeting techniques.
Course Code: 21MEMEL4070	
Course Title: THERMAL ENGINEERING LAB	
CO-1	To calculate given fuel properties
CO-2	To draw Port and Valve timings of IC engines
CO-3	To find performance parameter values of four stroke diesel engines
CO-4	To determine performance parameter values of petrol engines.
CO-5	To calculate efficiency of Air compressors & summarize the working of differenttypes of boilers and able to suggest suitable boiler based on requirement
Course Code: 21MEMEL4080	
Course Title: PRODUCTION TECHNOLOGY LAB	
CO-1	Demonstrate hands-on practical exposure on pattern processes
CO-2	Know the process ofmould preparation using patterns.
CO-3	Acquire fundamental knowledge on metal forming processes.
CO-4	Operate arc welding, gas welding, and resistance welding equipment
CO-5	Apply the practical concepts of powder metallurgy.
CO-6	Identify the difference between injection and blow moulding.
Course Code: 21MEMES4090	
Course Title: COMPUTER AIDED THREE-DIMENSIONAL INTERACTIVE APPLICATION	
CO-1	Can use interface of CATIA
CO-2	Can use command panel, menus, viewports and command icons in CATIA
CO-3	Can create two dimensional drawings in CATIA
CO-4	Can create 3D part drawings using commands in CATIA
Course Outcomes for Third Year Fifth Semester Course	
Course Code: 21MEMET5010	

Course Title: MACHINE TOOLS AND METROLOGY	
CO-1	Analyze mechanics of orthogonal cutting to metal machining.
CO-2	Acquire the knowledge on operations in conventional, automatic, Capstan & turretlathes
CO-3	Explain shaping, slotting, planning, drilling, and boring machines.
CO-4	Make gear and keyway in milling machines using indexing mechanisms andprinciples of finishing processes
CO-5	Outline the linear and angular measuring instruments
Course Code: 21MEMET5020	
Course Title: DYNAMICS OF MACHINERY	
CO-1	Demonstrate the gyroscopic effect on moving bodies like aeroplane, ship, 2- wheeler and 4-wheeler vehicles in various conditions using the concepts ofgyroscope
CO-2	Analyze the application and effect of friction in moving bodies like clutches,brakes and dynamometers in producing and transmission of energy.
CO-3	Identify the dynamic forces and torques developed in the rotating parts like cranks, flywheels and governors.
CO-4	Estimate the balanced and unbalanced forces and torques developed in rotating and reciprocating parts of an engine due to the presence of various components on theshaft.
CO-5	Evaluate various types of vibrations and its effects produced like whirling, resonance and others in machine parts during stationary and working conditions.
Course Code: 21MEMET5030	
Course Title: DESIGN OF MACHINE ELEMENTS-II	
CO-1	Analyze the pressure distribution in journal bearings.
CO-2	Compute design parameters of engine components such as cylinder, piston,connecting rod and crankshaft.
CO-3	Analyze shafts and couplings with different geometrical features under various loading conditions.
CO-4	Calculate geometrical relations for length of belt and chain.
CO-5	Identify types of pulleys/sprockets for belt and chain drives from manufacturer's catalogue and learned calculation procedure for beam strength and wear strength,effective load and module based on beam strength.
Course Code: 21MEMEP504A (PE-I)	
Course Title: CONVENTIONAL & NON-CONVENTIONAL POWER STATIONS	
CO-1	List, describe the main sources of energy and describe the functions of the majorequipment and auxiliaries of a Thermal power plants
CO-2	Identify, demonstrate the components of an IC Engine and hydro power plant andcompare the various combined cycle power plants.
CO-3	Explain the basic principles of nuclear reactions and explain working principle of different types of nuclear power plants.
CO-4	Apply the knowledge of Solar, Wind energy and Biomass, in generation of power.
CO-5	Identify the principles of direct energy conversion systems and explain the basicprinciples of Geothermal, Tide and Wave Energy
Course Code: 21MEMEP504B	
Course Title: NANO TECHNOLOGY	
CO-1	Explain the importance of Nanotechnology & its emergence in various fields.
CO-2	Identify various properties of nanomaterials in different applications.

CO-3	Select synthesis and fabrication methods, techniques and process parameters forprocessing of nanomaterials.
CO-4	Evaluate the properties of nanomaterials using different characterization tools & equipment.
CO-5	Discuss the concept of carbon allotropes in Nano Technology & their applications
Course Code: 21MEMEP504C	
Course Title: INDUSTRIAL ROBOTICS WITH ARTIFICIAL INTELLIGENCE	
CO-1	Identify various robot configurations, actuators and sensors for a robot based on specific application.
CO-2	Carry out the motion analysis and kinematic analysis for forward and inversekinematics
CO-3	Perform trajectory planning for a robot manipulator
CO-4	Explain the specific applications of a robot in industry.
CO-5	Apply the concepts of Artificial Intelligence in manufacturing industry.
Course Code: 21MEMEL5060	
Course Title: MACHINE TOOLS AND METROLOGY LAB	
CO-1	Understand the mechanism of chip formation.
CO-2	Analyze various cutting tool parameters in different machining operations.
CO-3	Operate different machine tools.
CO-4	Apply the knowledge of different instruments for linear and angular measurements.
CO-5	Choose the appropriate measuring instrument for a specific requirement.
Course Code: 21MEMEL5070	
Course Title: THEORY OF MACHINES LAB	
CO-1	Study different types of four bar mechanism, gears and gear trains.
CO-2	Estimate the coefficient of friction between belt and pulley drive and also find the moment of inertia of a flywheel.
CO-3	Calculate the gyroscopic couple of a rotating disc under various loads and speed conditions and analyse speed regulations of Hartnell governor and cam jump phenomenon.
CO-4	Distinguish between static and dynamic balancing of rotating masses andperformance characteristics of a screw jack.
CO-5	Find the natural frequency of a vibratory system with various beams and critical speed of a shaft for different configurations.
Course Code: 21MEMEN5090	
Course Title: MACHINE DRAWING PRACTICE LAB	
CO-1	Identify the national and international standards pertaining to machine drawing.
CO-2	Illustrate various machine components through drawings.
CO-3	Construct an assembly drawing of a machine unit
CO-4	Interpret a set of working drawings of a machine assembly including detaildrawings, bill of materials, part specifications
CO-5	Analyze the part or assembly drawings as per the conventions.
Course Code: 21XXMEOX0XA	
Course Title: OPERATIONS RESEARCH	
CO-1	Formulate and solve mathematical model (linear programming problem) for real situations like production and distribution of goods using basic linear programmingtechniques li graphical methods

CO-2	Apply the concepts of linear programming for decision making like simplex and dual simplex algorithms in production industries.
CO-3	Calculate the optimal values of cost, job distribution and placement usingtransportation, assignment methods
CO-4	Select the best optimal sequencing and replacement time for the machines in an industry for its better and economic growth using sequencing and replacementtechniques.
CO-5	Select the best optimal time and strategy to be followed by any organization to identify the waiting times and strategies to be implemented using waiting lines andgame theory techniques for a continuous and successful growth of an industry.

Course Code: 21XXMEOX0XB	
Course Title: FUNDAMENTALS OF MECHANICAL ENGINEERING	
CO-1	Understand the concepts of fluid properties like specific gravity, viscosity, density, surface tension.
CO-2	To study the classification of turbines and work done and efficiency of the differentturbines and study about draft tube theory and to determine the function efficiency.
CO-3	This study is also used for the estimation of efficiency and performance of theturbine with the study of characteristics curves.
CO-4	To study automobile engine working, valve timing and associated systems such as lubricating system, cooling system, fuel feed system, ignition system etc., theirnecessity, requirements, construction details, different types and their working
CO-5	To study the construction, working principles and advantages of belt and ropedrives, selection of belt drive- types of belt drives, V-belts, types of coupling.
Course Code: 21XXMEOX0XC	
Course Title: INDUSTRIAL ROBOTICS	
CO-1	Understand various applications of robotics and classification of coordinate systemand control systems
CO-2	Build the concepts of components of industrial robotics.
CO-3	Apply kinematic analysis with D-H notation, forward and inverse kinematics
CO-4	Model trajectory planning for a manipulator by avoiding obstacles.
CO-5	Understand different types of actuators and various applications of robots inmanufacturing
Course Code: 21XXMEOX0XD	
Course Title: ENGINEERING MATERIALS	
CO-1	Classify different bonds in solids and understand crystallization of the metals, forthe formation of the solid solutions and compounds.
CO-2	Different phase diagrams and study of binary phase diagrams
CO-3	Recorgnize the property requirements of a given application and suggest suitable ferrous & nonferrous alloys
CO-4	Analyze the property requirements of a given application and suggest appropriateheat treatment
CO-5	Identified the property requirements of a given application and suggest asuitable ceramic, composite materials
CO-6	Understand the relationships between structure, composition and properties ofdifferent engineering materials
Course Code: 21XXMEOX0XE	

Course Title: INTRODUCTION TO MATERIAL HANDLING EQUIPMENTS	
CO-1	Classify the material handling equipment
CO-2	Explain the usage of different material handling equipment in industry
CO-3	Discuss how to connect loading stations to the different discharge conditions
CO-4	Associate the usage of cranes at industries
CO-5	Associate the usage of hoists and monorails at industries
Course Code: 21XXMEOX0XF	
Course Title: PRODUCTION PLANNING AND CONTROL	
CO-1	Choose the acceptable production planning and control system for designing anddevelopment of a product.
CO-2	Examine the forecasts made in the manufacturing and service sectors by usingselected quantitative and qualitative techniques
CO-3	Categorize the production systems based on the inventory principles andtechniques to optimize/make best use of resources.
CO-4	Select and use an appropriate principles/methods/ techniques/ modern concept withreference to given application/situation in the preparation of route sheets with scheduling and loading in manufacturing systems
CO-5	Illustrate the role of a dispatching and follow-up necessary at various stages of manufacturing in an industry.
Course Code: 21XXMEOX0XG	
Course Title: NON-CONVENTIONAL SOURCES OF ENERGY	
CO-1	The student understands the principles and working of solar and solar energy collection.
CO-2	The students apply the principles of solar energy storage, applications in power generation.
CO-3	The students Apply the knowledge of Wind energy and Biomass, in generation of power
CO-4	The students Apply the Principles and working of Geothermal energy power plant, OTEC plants, tidal, wave energy and Mini hydel power plants in generation of the electric power.
CO-5	Apply the principles of direct energy conversion systems like Thermoelectricgenerators, MHD generators and fuel cells, in generation of electric power.
Course Code: 21XXMEOX0XH	
Course Title: FLUID MECHANICS AND FLUID MACHINERY	
CO-1	Demonstrate various properties of fluids, pressure measurement devices and theirapplications.
CO-2	Identify the kinematics and dynamics properties of fluids flowing in differentconditions and its effects on the bodies.
CO-3	Estimate the effect of various losses in fluids due to flowing and obstructions and understand using the concepts of pipe losses and Boundary layer theory.
CO-4	Analyze the performance of hydraulic turbines, units and specific quantities based on the design by applying the knowledge of turbomachinery using analyticalmethods and velocity triangles.
CO-5	Analyze the performance of various hydraulic pumps based on workings anddesign.

SITE 18 Course Outcomes

B. Tech- (Electronics and Communication Engineering)

Course Outcomes for First Year First Semester Course	
Course Code: 18CMMAT1010	
Course Title: ENGINEERING MATHEMATICS-I	
CO-1	To solve first order differential equations.
CO-2	To solve linear differential equations with constant coefficients.
CO-3	To find the extreme of a function.
CO-4	To solve partial differential equations
CO-5	To evaluate multiple integrals
CO-6	To verify vector integral theorems
Course Code: 18ECPHT1020	
Course Title: ENGINEERING PHYSICS	
CO-1	Calculate the electric field intensity and electrostatic potential for a chargedistribution.
CO-2	Solve the electrostatics problems in presence of dielectrics.
CO-3	Calculate the magnetic field induction using the Biot- Savart's law.
CO-4	Calculate the magnetic fields due to time varying electrical fields.
CO-5	Derive the relation between electrical field intensity and time varying magnetic fields.
CO-6	Apply Maxwell's equations to understanding the propagation of EM wave in vacuum and non-conducting medium.
Course Code: 18CMCST1030	
Course Title: PROGRAMMING FORPROBLEM SOLVING	
CO-1	Formulate algorithms, translate them into programs and correct programerrors.
CO-2	choose right control structures suitable for the problem to be solved.
CO-3	decompose reusable code in a program into functions.
CO-4	make use of arrays, pointers, structures and unions effectively.
CO-5	store and retrieve data from permanent storage.
CO-6	learn file operations
Course Code: 18CMMEL1040	
Course Title: ENGINEERING GRAPHICS	

CO-1	Students will be able to construct Polygons using general methods, inscribe and describe polygons on circles, draw curves (parabola, ellipse andhyperbola, cycloids, involutes by general methods
CO-2	Students will be able to read, interpret and construct plain scales, diagonal scales and venire scales.
CO-3	Student will be able to draw orthographic projections of points, lines, Planes & Solids inclined to one reference plane. Students will be able to apply various concepts to solve practical problems related to engineering.
CO-4	Student will be able to draw sections and sectional views of Solids.
CO-5	Student will be able to draw isometric view of lines, plane figures and simplesolids. Student will be able to convert given isometric views into orthographic views. Students will be able to apply various concepts to solvepractical problems related to engineering.
CO-6	Student will be able to draw objects using draw and modify toolbars of AutoCAD.

Course Code: 18ECPHL1050	
Course Title: ENGINEERING PHYSICS LAB	
CO-1	Determine the electrostatic field and static potentials.
CO-2	Apply the Biot- Savart's law in case of circular coils.
CO-3	Determine the self-inductance of a coil.
CO-4	Measure e/m value of a charged particle in electrical and magnetic fields.
CO-5	Determine the Hall coefficient using the phenomenon of Hall Effect.
CO-6	Understand the particle behaviour of EM wave when it interacts with matter.
Course Code: 18CMCSL1060	
Course Title: PROGRAMMING FOR PROBLEM SOLVING LAB	
CO-1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solvingproblems.
CO-2	Examine and analyse alternative solutions to a problem.
CO-3	Design an algorithmic solution to a problem using problem decompositionand step-wise refinement.
CO-4	Demonstrate conversion of iterative functions to recursive and vice-versa.
CO-5	Implement the concepts of arrays.
CO-6	Implement the structures, Unions and files.
Course Code: 18CMMEL1070	
Course Title: WORK SHOP/MANUFACTURING PRACTICE	
CO-1	Students will be able to make use of basic carpentry joints to make furniture.
CO-2	Students will be able to fabricate mechanical engineering assemblies using fitting joints.

CO-3	Students will be able to produce various machine components by usingfoundry, black smithy, machining and plastic moulding techniques.
Course Code: 18CMCHN1080	
Course Title: ENVIRONMENTAL SCIENCE	
CO-1	Able to know the importance of Environmental studies and the measures tobe taken to overcome global environmental challenges.
CO-2	Able to understand the concept of ecosystem and its diversity.
CO-3	Able to gain knowledge on natural resources.
CO-4	Able to understand the concept of biodiversity.
CO-5	Able to gain knowledge on environmental pollution.
CO-6	Gain knowledge on environmental legislation and global treaties.
ourse Outcomes for First Year Second Semester Course	
Course Code: 18CMEGT2010	
Course Title: TECHNICAL ENGLISH	
CO-1	Ability to understand Scientific vocabulary and use them confidently.
CO-2	Familiarity with the basic principles of writing clear sentences andparagraphs.
CO-3	Ability to write error free simple technical passages.
CO-4	Knowledge of writing different writing styles.
CO-5	Confidence to write letters and technical reports clearly and coherently.
CO-6	Get inspired by achievements and values upheld by a renowned technocrat.
Course Code: 18ECPHT1020	
Course Title: ENGINEERINGMATHEMATICS II	
CO-1	Solve system of linear equations
CO-2	Find Eigen values and Eigen vectors of a matrix
CO-3	Solve initial value problems by using Laplace transforms
CO-4	Find the solution of algebraic/ transcendental equations and interpolatethe functions.
CO-5	Evaluate numerical integration and to solve ordinary differential equations byusing numerical methods.
CO-6	Find Fourier series of a periodic function and to determine the Fouriertransform of a function
Course Code: 18CMCHN108	
Course Title: ENGINEERINGCHEMISTRY	
CO-1	Able to rationalise periodic properties like ionization potential, electronegativity and oxidation states.
CO-2	Able to know the nature and working of various electrodes.
CO-3	Analyse bulk properties and processes using thermodynamicconsiderations
CO-4	Able to synthesize organic molecules using different types of chemicalreactions.
CO-5	Able to understand the concepts of atomic and molecular orbitals.

CO-6	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used for exciting different molecular energy levels.
Course Code: 18CMCHN108	
Course Title: BASIC ELECTRICALENGINEERING	
CO-1	Able to analyze DC circuits by using KCL, KVL and Network theorems
CO-2	Able to analyze AC circuits
CO-3	Able to explain the construction and working of rotating electrical machines
CO-4	Able to describe DC-DC and DC-A converters
CO-5	Able to explain about types of LV switch gear and types of batteries
Course Code: 18CMCHN108	
Course Title: ENGLISH COMMUNICATIONSKILLS LAB	
CO-1	Listening Comprehension
CO-2	Dialogues
CO-3	Pronunciation
CO-4	Interpersonal Communication Skills
CO-5	Presentation Skills
CO-6	Discussions and Debates
Course Code: 18CMCHN108	
Course Title: ENGINEERINGCHEMISTRY LAB	
CO-1	Able to measure molecular properties like surface tension and viscosity
CO-2	Able to determine chloride content of given water sample.
CO-3	Able to synthesize a drug.
CO-4	Able to determine rate constant as a function of time.
CO-5	Able to determine strength of acids using conductivity meter.
CO-6	Able to determine amount of Fe (II) using potentiometer.
Course Code: 18CMCHN108	
Course Title: BASIC ELECTRICALENGINEERING LAB	
CO-1	Able to determine the time response and resonance of given RL, RC and RLCcircuits
CO-2	Able to determine the response using Superposition, Norton and Thevinins.
CO-3	Able to determine the power, efficiency and regulation of ac machines
CO-4	Able to determine the speed torque characteristics of dc and induction motors
CO-5	Able to analyse the operation of Buck and boost converter and voltage source inverter.
CO-6	Able to analyse the operation of LV Switch gear system.
Course Code: 18CMCHN108	
Course Title: CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS	

CO-1	Have general knowledge and legal literacy and thereby to take up competitiveexaminations.
CO-2	Understand state and central policies, fundamental duties.
CO-3	Understand Electoral Process, special provisions.
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies
CO-5	Understand Engineering ethics and responsibilities of Engineers
CO-6	Understand Engineering Integrity & Reliability
Course Outcomes for second Year Third Semester Course	
Course Code: 18CMMAT3010	
Course Title: Engineering Mathematics-III	
CO-1	Find the function of a complex variable
CO-2	Evaluate complex integration and expand functions using Taylor &Maclaurin‟s series
CO-3	Evaluate integrals using Residues
CO-4	Find the statistical parameters for discrete distributions
CO-5	Find the statistical parameters for continuous distributions
CO-6	Test the hypothesis
Course Code: 18ECECT3020	
Course Title: ELECTRONIC DEVICES	
CO-1	Understand the basic concepts of semiconductor physics.
CO-2	Understand the construction and operating principle of p-n junction diode and
	special semiconductor diodes
CO-3	Apply diodes as rectifiers and analyze characteristics with and without filters
CO-4	Understand the construction and principle of operation of BJT and FET w.r.tV-I characteristics.
CO-5	Analyze various biasing techniques for BJT and FET.
CO-6	Analyze BJT and FET using small signal analysis.
Course Code: 18ECECT3030	
Course Title: NETWORK THEORY	
CO-1	Analyze basic electrical networks using mesh, nodal techniques.
CO-2	Analyze basic electrical networks using topological description of thenetwork.
CO-3	Apply and analyze various network theorems for DC and AC circuits.
CO-4	Analyze the transient response of R-L, R-C and R-L-C networks
CO-5	Analyze the characteristics of Filters and Attenuators.
CO-6	Analyze two port networks.
Course Code: 18ECECT3040	

Course Title: SIGNALS & SYSTEMS	
CO-1	Understand various signals and systems and demonstrate their properties.
CO-2	Interpret Fourier analysis of continuous-time Signals.
CO-3	Apply sampling theorem for signal conversion from continuous-time signalsto discrete-time.
CO-4	Analyze continuous time signals by using Laplace transforms.
CO-5	Understand various operations on LTI systems.
CO-6	Apply z-transform to analyze discrete-time signals and systems.
Course Code: 18ECECT3050	
Course Title: PROBABILITY & STOCHASTIC PROCESSES	
CO-1	Understand the axiomatic formulation of Probability Theory
CO-2	Demonstrate the concept of random variable and its distribution, densityfunctions
CO-3	Apply statistical operations and transformations on 1-D random variable
CO-4	Extend the concept of 1-d random variable to multiple random variables
CO-5	Analyze random processes by understanding its temporal and Spectralcharacteristics
CO-6	Analyze linear Time Invariant systems with random inputs
Course Code: 18ECECL3060	
Course Title: ELECTRONIC DEVICES LAB	
CO-1	Analyze the characteristics of Semiconductor devices.
CO-2	Design and verify the biasing circuit for BJT
CO-3	Design and analyze BJT and FET Amplifier Circuits
Course Code: 18ECECL3070	
Course Title: NETWORK THEORY LAB	
CO-1	Analyze complex DC and AC linear circuits
CO-2	Apply concepts of electrical circuits across engineering
CO-3	Analyze the given electrical network by using PSPICE Simulation tool
Course Code: 18ECECN3080	
Course Title: PULSE & DIGITAL CIRCUITS	
CO-1	Analyze linear wave shaping circuits with different inputs.
CO-2	Design Non linear wave shaping circuits.
CO-3	Design switching circuits.
CO-4	Analyze different Multivibrators.
CO-5	Design different multivibrators.
CO-6	Understand different types of time base generators
Course Code: 18ECECT4010	
Course Title: DIGITAL SYSTEM DESIGN	

CO-1	Understand the basic number systems, conversions and Boolean algebra.
CO-2	Design digital systems using combinational circuits.
CO-3	Design digital systems using sequential circuits.
CO-4	Understand the concepts of logic families and corresponding logic levels.
CO-5	Design digital system using PLDs and Understand the construction andworking of memories
CO-6	Design digital systems using VHDL
Course Outcomes for second Year fourth Semester Course	
Course Code: 18CMMET4020	
Course Title: ENGINEERING MECHANICS	
CO-1	Able to Resolve the forces into components, moment of force and itsapplications
CO-2	Construct free body diagrams and develop appropriate equilibrium equations.
CO-3	Determine centroid and moment of inertia for composite areas.
CO-4	Determine the kinematic relations of particles & rigid bodies.
CO-5	Apply equations of motion to particle and rigid body.
CO-6	Analyze motion of particles & rigid bodies using the principle of energy andmomentum methods.
Course Code: 18ECECT4030	
Course Title: ELECTROMAGNETIC WAVES AND TRANSMISSION LINES	
CO-1	Analyze wave equations in different mediums
CO-2	Understand the reflection and refraction mechanism of plane waves withnormal and oblique incidences
CO-3	Demonstrate types of transmission lines and its fundamental characteristics
CO-4	Apply the characteristics of transmission lines to analyze the impedance matching
CO-5	Understand TE/TM/TEM modes of propagation in rectangular waveguides
CO-6	Demonstrate the working mechanism of Micro strip and cavity resonators
Course Code: 18ECECT4040	
Course Title: ANALOG CIRCUITS	
CO-1	Analyze and design single and multistage amplifiers at low, mid and highfrequencies.
CO-2	Understand the concept of feedback and design different oscillator circuits.
CO-3	Analyze and design different types of feedback amplifiers
CO-4	Design different Power amplifiers and evaluating the efficiency.
CO-5	Demonstrate linear and non-linear applications of operational amplifiers.
CO-6	Demonstrate 555 timer applications and different Data Converters
Course Code: 18ECECT4050	
Course Title: ANALOG & DIGITAL COMMUNICATIONS	
CO-1	Understand the concept of modulation and amplitude modulation.

CO-2	Differentiate various schemes of amplitude modulation and demodulationtechniques.
CO-3	Understand the fundamentals of angle modulation and demodulationtechniques.
CO-4	Extend the various analog modulation schemes for pulse carrier
CO-5	Establish various pulse modulation schemes in digital domain
CO-6	Interpret probability error for digital modulation techniques.
Course Code: 18ECECL4060	
Course Title: DIGITAL SYSTEM DESIGN LAB	
CO-1	Design digital systems using combinational circuits using VHDL.
CO-2	Design digital systems using sequential circuits using VHDL.
CO-3	Design Memories using VHDL
Course Code: 18ECECL4070	
Course Title: ANALOG CIRCUITS LAB	
CO-1	Design two stage amplifier and analyse frequency response at low, mid andhigh frequencies.
CO-2	Design feedback amplifier and analyse its frequency response
CO-3	Design different oscillator circuits and evaluate its frequency of oscillation
CO-4	Design different Power amplifiers and evaluate the efficiency.
CO-5	Design linear and non-linear applications of operational amplifiers.
Course Outcomes for Third Year Fifth Semester Course	
Course Code: 18ECECT5010	
Course Title: Control Systems	
CO-1	Characterise a control system and effects of feedback
CO-2	Develop mathematical model of the physical systems.
CO-3	Apply time response analysis on first and second order systems
CO-4	Analyse the system stability using Routh Hurwitz and Root locus techniques
CO-5	Analyse the system stability using frequency response analysis
CO-6	Apply state variable analysis to continuous time systems and obtain the relationship between state variable representation and transfer functions.
Course Code: 18CMEGT5020	
Course Title: PERSONALITY DEVELOPMENT & PROFESSIONALCOMMUNICATION	
CO-1	Understand Personality development process and learn to implement effectivetechniques.
CO-2	Understand how people behave and regulate self behaviours and learn towork in a team.
CO-3	Know their career values, indentify their skills, set goals for enhancing theircareer skills.
CO-4	Understand and learn how to deal with problems and practice problemsolving skills.
CO-5	Learn the principles of professional communication & application of the same

CO-6	Face job interviews confidently and work a team effectively
Course Code: 18CMMST5030	
Course Title: MANAGEMENT SCIENCE	
CO-1	Execute the functions of Management, Principles ofManagement&Leadership styles.
CO-2	Examine Statistical Quality Control Techniques, Methods of inspection, theconcept of Inventory Management and Control
CO-3	Predict the Customer Behaviour and Employees Contribution towardssuccess of organization.
CO-4	Identify different Strategies for the Development of the Organisation.
CO-5	Analyse Project Management Techniques like CPM, PERT and Crashing.
CO-6	Apply various contemporary issues in Management Practices like TQM,Business Process Reengineering and BPO etc.
Course Code: 18ECECT5040	
Course Title: MICROPROCESSORS & MICRO CONTROLLERS	
CO-1	Understand the architectural and operation concepts of 8086 microprocessor.
CO-2	Analyze programming concepts of 8086 microprocessor.
CO-3	Apply interfacing concepts to implement microprocessor based system.
CO-4	Interpret the architectural and operation concept of 8051 microcontroller.
CO-5	Apply the programming model of 8051 Microcontroller using embedded C.
CO-6	Discuss the operational aspects of advanced Processors.
Course Code: 18ECECT5050	
Course Title :DIGITAL SIGNAL PROCESSING	
CO-1	Apply the difference equations concept for analyzing the Discrete TimeSystems
CO-2	Use the FFT algorithm for solving the DFT of a given signal
CO-3	Design a Digital IIR filter for the given specifications
CO-4	Design a Digital FIR filter for the given specifications
CO-5	Use Multirate signal Processing concepts in various applications.
CO-6	Apply the signal processing concepts on DSP Processor.
Course Code: 18ECECL5070	
Course Title: DIGITAL SIGNAL PROCESSING LAB	
CO-1	Generate the fundamental discrete time signals and perform addition operation between sinusoidal signals
CO-2	Perform linear and circular convolution operations
CO-3	Perform DFT and IDFT operations
CO-4	Design a Digital IIR filter for the given specifications
CO-5	Design a Digital FIR filter for the given specifications
CO-6	Perform basic operations in image processing and its applications.
Course Outcomes for Third Year sixth Semester Course	
Course Code: 18CMBIT6010	
Course Title: BIOLOGY FOR ENGINEERS	

CO-1	Describe how biological observations of 18th Century that lead to majorDiscoveries.
CO-2	Convey that classification per se is not what biology is all about but highlighttheunderlying criteria, such as morphological, biochemical and ecological
CO-3	Highlight the concepts of recessiveness and dominance during the passage ofgenetic material from parent to offspring
CO-4	Convey that all forms of life have the same building blocks and yet themanifestations are as diverse as one can imagine
CO-5	Classify enzymes and distinguish between different mechanisms of enzymeaction.
CO-6	convey that "Genetics is to biology what Newton"s laws are to PhysicalSciences"
Course Code: 18ECECT6020	
Course Title: COMPUTER ARCHITECTURES & ORGANIZATION	
CO-1	Understand the basic structure of Computers and their functional units.
CO-2	Analyze the machine instruction and programming concepts.
CO-3	Analyze the interface between the peripheral devices.
CO-4	Analyze different types of memories.
CO-5	Understand the operation of processing unit.
CO-6	Interpret parallel processing, Pipelining and parallel processing concepts.
Course Code: 18ECECP6031	
Course Title : ANTENNAS AND WAVE PROPAGATION	
CO-1	Understand the concepts of radiation mechanism and antenna parameters
CO-2	Apply electromagnetic radiation for wire antennas and loop antennas
CO-3	Analyze and compare the characteristics of various antenna arrays
CO-4	Analyze non-resonant and broadband antennas
CO-5	Design VHF, UHF and Microwave antennas
CO-6	Differentiate wave propagation modes and their propagation characteristics
Course Code: 18ECECP6032	
Course Title : CMOS VLSI DESIGN	
CO-1	Identify the industry standard fabrication techniques for IC manufacturing.
CO-2	Formulate the current and voltage relations in CMOS logic based transistordesign.
CO-3	Design combinational logic circuits based on CMOS digital logic.
CO-4	Analyze amplifier designs using CMOS analog logic.
CO-5	Design sequential logic circuits based on CMOS digital logic.
CO-6	Analyze op-amps designs using CMOS analog logic.
Course Code: 18ECECP6033	
Course Title : ADVANCED DIGITAL SIGNAL PROCESSING	
CO-1	Comprehend the DFTs and FFTs.
CO-2	Acquire the basics of multi rate digital signal processing

CO-3	Demonstrate the applications of multi rate digital signal processing
CO-4	Analyze the power spectrum estimation.
CO-5	Implement the digital filters.
CO-6	Comprehend the Finite word length effects in Fixed point DSP Systems.
Course Code: 18ECECP6041	
Course Title : MICROWAVE THEORY AND TECHNIQUES	
CO-1	Understand the generation & amplification of the microwave signals andobtain the characteristics of O & M Type Tubes.
CO-2	Analyze the passive components for microwave systems and obtain the characteristics of these components.
CO-3	Analyze the reciprocal and nonreciprocal devices at microwave frequencies
CO-4	Analyze the Microwave design principles
CO-5	Analyze the Microwave antennas
CO-6	Measure various Microwave parameters (VSWR, Impedance, etc.).
Course Code: 18ECECP6042	
Course Title : DIGITAL DESIGN THROUGH VERILOG HDL	
CO-1	Understand the basics of Verilog hardware description languages.
CO-2	Apply the gate level and dataflow modeling styles to all digital circuits.
CO-3	Construct digital circuits using behavioral modeling.
CO-4	Understand switch level modeling along with system tasks and functions.
CO-5	Implement sequential logic design and analyze the models by learning testbench programming
CO-6	Understand various architectures of commercial FPGAs.
Course Code: 18ECECP6043	
Course Title : DIGITAL IMAGE PROCESSING	
CO-1	Understand the fundamentals and transforms of digital image processing
CO-2	Apply image enhancement and filtering concepts in spatial and frequencydomains.
CO-3	Apply image restoration and understand color image processing techniques.
CO-4	Apply different segmentation algorithms on digital images
CO-5	Analyze digital images using compression algorithms
CO-6	Analyze digital images using wavelets
Course Code: 18CMMST6050	
Course Title : ENGINEERING ECONOMICS AND FINANCIAL MANAGEMENT	
CO-1	Equipped with the knowledge of managerial economics and estimatingdemand for a product.
CO-2	Examine the Production Concept and familiar with the concepts of iso-quants, iso-cost lines and MRTS
CO-3	Predict the cost of production and its relevance to managerial decisionmaking
CO-4	Differentiate various the Markets and Pricing methods along with BusinessCycles.
CO-5	Prepare Financial Statements along with Analysis

CO-6	Analyse and interpret various investment project proposals with the help ofCapital Budgeting techniques.
Course Code: 18ECECT6060	
Course Title : COMPUTER NETWORKS	
CO-1	Recognize different type reference models, topologies and networks.
CO-2	Describe the functions of physical layer.
CO-3	Analyze various data link layer protocols.
CO-4	Demonstrate about different Routing Algorithms in Computer Networks.
CO-5	Demonstrate transport layer services and protocols.
CO-6	Interpret network security and computer network applications.
Course Code: 18ECECL6070	
Course Title : COMPUTER NETWORKS LAB	
CO-1	Interpret the different linear data structures.
CO-2	Demonstrate Elementary data link protocols and routing algorithms.
CO-3	Construct Transport layer applications.
Course Outcomes for FOURTH Year SEVENTH Semester Course	
Course Code: 18ECECT7010	
Course Title: ELECTRONIC MEASUREMENTS AND INSTRUMENTATION	
CO-1	Interpret the performance characteristics and principle of various meters in Electronic Measuring Instruments.
CO-2	Use different types of Electronic equipment for generating and analysing various signals.
CO-3	Discriminate a signal / waveform with various types of oscilloscopes.
CO-4	Construct AC bridges which can measure Inductance, Capacitance, Resistance
CO-5	Summarize the working of active & passive transducers
CO-6	Distinguish various transducers for measurement of different parameters.
Course Code: 18ECECP7021	
Course Title: OPTICAL COMMUNICATIONS	
CO-1	Understand basic concepts of optical fibers
CO-2	Analyze different losses occurs in optical fibers and
CO-3	Understand the operation of LEDs, laser diodes, and PIN photo detectors
CO-4	Illustrate different types of optical connectors
CO-5	Understand the models of analog and digital receivers
CO-6	Analyze optical system design.
Course Code: 18ECECP7022	
Course Title: LOW POWER VLSI DESIGN	
CO-1	Understand the concepts of Low-Power Design Approaches.
CO-2	Apply the Low-Power design approaches for designing Low-Power Circuits.

CO-3	Analyze the Low-Voltage Low-Power Circuits.
CO-4	Design different adders to satisfy low power requirements
CO-5	Construct the Low Power Designs to Different Applications.
CO-6	Understand of Low-Voltage Low-Power Memories and Basics of DRAM.
Course Code: 18ECECP7023	
Course Title: INFORMATION THEORY AND CODING	
CO-1	Explain basic concept of information theory
CO-2	Make use of different source coding techniques.
CO-3	Identify different error control coding techniques.
CO-4	Construct Convolutional codes
CO-5	Summarize different compression standards.
CO-6	Explain different audio and video coding techniques.
Course Code: 18ECECP7031	
Course Title: WIRELESS SENSOR NETWORKS	
CO-1	Study basic concepts of wireless sensor networks
CO-2	Design wireless sensor networks for a given application
CO-3	Understand MAC protocols used for different communication standards
CO-4	Understand emerging research areas in the field of sensor networks
CO-5	Study the node and network architecture of sensor nodes.
CO-6	Study the sensor node hardware and software platforms.
Course Code: 18ECECP7032	
Course Title: BIO MEDICAL ELECTRONICS	
CO-1	Identify the origin of bioelectric potential and bio medical Engineering.
CO-2	Distinguish different types of electrodes, transducers, and their principles.
CO-3	Analyze the functionality of cardiovascular system and their measurements.
CO-4	Distinguish various aspects of measurements in the Respiratory System
CO-5	Demonstrate the patient care monitoring systems and therapeutic- prostheticdevices.
CO-6	Use of diagnostic techniques and need for recorders and safety measures.
Course Code: 18ECECP7033	
Course Title: EMBEDDED SYSTEM DESIGN	
	Understand the fundamentals of the embedded systems.
CO-2	Know the hardware details of the embedded systems.
CO-3	Learn concept of firmware design approaches, Interrupt concept.

CO-1	Learn about the various embedded software development tools.
CO-5	Understand the embedded system design life cycle and co-design issues with case studies.
CO-6	Understand the working principals of simple embedded system applications
Course Code: 18ECECL7061	
Course Title: MICROWAVE & OPTICAL COMMUNICATIONS LAB	
CO-1	Identify and demonstrate the working of various microwave and opticalcomponents.
CO-2	Analyze Microwave Passive and active Devices by conducting experimentsand measuring various parameters.
CO-3	Analyze the characteristics of Optical Sources by conducting experiments andmeasuring various parameters.
CO-4	Analyze the characteristics of optical fiber by conducting experiments and measuring various parameters.
CO-5	Analyze antenna performance by conducting experiments and measuringvarious parameters.
Course Code: 18ECECL7062	
Course Title: VLSI DESIGN LAB	
CO-1	Design digital systems using combinational and sequential circuits usingMentor Graphics.
CO-2	Draw the layout and schematic diagrams for digital circuits
CO-3	Improve the logic minimization skills
Course Code: 18ECECL7063	
Course Title: EMBEDDED SYSTEMS LAB	
CO-1	Understood the operation of ARM Cortex M3 boards and Raspberry Piboards
CO-2	Learn the various interfacing analog and digital interfacing concepts withARM Cortex M3.
CO-3	Design and implementing real time clock communication protocols withmodern microcontroller boards.
CO-4	Learn the Raspberry Pi (RPi) single-board computer, and how to use its text-based commands to explore the environment of the RPi.
CO-5	Compile, design and test various interfacing and displaying modules with RPi board using Python language.
Course Outcomes for FOURTH Year EIGHT Semester Course	
Course Code: 18ECECP8011	
Course Title: CELLULAR AND MOBILE COMMUNICATIONS	
CO-1	Learn Basic concepts of Cellular System
CO-2	Identify Co-channel and Non co-channel Interference
CO-3	Know the concepts Cell coverage for signal
CO-4	Choose proper cell site antenna
CO-5	Apply different methods of Channel Assignment and Handoff mechanisms
CO-6	Apply wireless technologies in cellular and mobile communications
Course Code: 18ECECP8012	
Course Title: VLSI PHYSICAL DESIGN AUTOMATION	

CO-1	Understand the basics of design cycle stages.
CO-2	Retrieve the graph theory concepts and relate to VLSI physical design.
CO-3	Learn partitioning and floor planning algorithms.
CO-4	Learn different placement and routing algorithms.
CO-5	Differentiate routing algorithms for clock and power sources.
CO-6	Understand design automation for FPGAs and MCMs.
Course Code: 18ECECP8013	
Course Title: INTERNET OF THINGS AND ITS APPLICATIONS	
CO-1	Understand fundamentals of IoT systems.
CO-2	Describe the functions of IoT architectures.
CO-3	Apply real world design constraints on IoT architectures.
CO-4	Analyze IoT data link and Network layer protocols.
CO-5	Demonstrate transport and Session layer services and protocols of Iot.
CO-6	Interpret Service layer and network security protocols.
Course Code: 18ECECP8021	
Course Title: RADAR SYSTEMS	
CO-1	Learn basic concepts of RADAR Systems.
CO-2	Familiarize the RADAR equation.
CO-3	Understand different types of RADAR and their working principles.
CO-4	Gain knowledge on RADAR signal detection methods.
CO-5	Understand about radio navigation techniques.
CO-6	Acquire information about RADAR transmitters and receivers
Course Code: 18ECECP8022	
Course Title: NANOELECTRONICS	
CO-1	Understand the basic concepts of Nano electronics
CO-2	Know about various Nano materials.
CO-3	Apply the knowledge of device fabrication in nanoscale engineering.
CO-4	Familiarize with the characteristics of different Nano electronic Devices.
CO-5	Understand the concept of Tunnelling in Nano electronics.
CO-6	Understand the concept of electron transport across Nano electronics.
Course Code: 18ECECP8023	
Course Title: EMBEDDED & REAL TIME CONCEPTS	
CO-1	Review basic operation of the Real Time Embedded Systems.
CO-2	Describe the various communication models used in Embedded application
CO-3	Understand various Embedded System design computing models

CO-4	Describe the concepts of Real Time Operating Systems.
CO-5	Demonstrate the fundamentals of Embedded Linux concepts
CO-6	Apply RTOS in Embedded & Real Time System Hardware.

SITE 21 Course Outcomes

B. Tech- (Electronics and Communication Engineering)

Course Outcomes for First Year First Semester Course	
Course Code: 18CMMAT1010	
Course Title: ENGINEERING MATHEMATICS-I	
CO1	Solve first order differential equations.
CO2	Solve linear differential equations with constant coefficients.
CO3	Find the extreme of a function.
CO4	Solve partial differential equations
CO5	Evaluate multiple integrals
CO6	Verify vector integral theorems
Course Code: 18ECPHT1020	
Course Title: ENGINEERING PHYSICS	
CO1	Calculate the electric field intensity and electrostatic potential for a charge distribution.
CO2	Solve the electrostatics problems in presence of dielectrics.
CO3	Calculate the magnetic field induction using the Biot- Savart's law.
CO4	Calculate the magnetic fields due to time varying electrical fields.
CO5	Derive the relation between electrical field intensity and time varying magnetic fields.
CO6	Apply Maxwell's equations to understanding the propagation of EM wave in vacuum and non-conducting medium.
Course Code: 18CMCST1030	
Course Title: PROGRAMMING FOR PROBLEM SOLVING	
CO1	Formulate algorithms, translate the min to programs and correct program errors.
CO2	Choose right control structures suitable for the problem to be solved.
CO3	Decompose reusable code in a program into functions.
CO4	Make use of arrays, pointers, structures and unions effectively.
CO5	Store and retrieve data from permanent storage.
CO6	learn file operations
Course Code: 18CMMEL1040	
Course Title: ENGINEERING GRAPHICS	
CO1	construct Polygons using general methods, inscribe and describe polygons on circles, draw curves (parabola, ellipse and hyperbola, cycloids, involutes by general methods
CO2	read, interpret and construct plain scales, diagonal scales and vernier scales

CO3	draw orthographic projections of points, lines, Planes & Solids inclined to one reference plane. Students will be able to apply various concepts to solve practical problems related to engineering.
CO4	draw sections and sectional views of Solids
CO5	draw isometric view of lines, plane figures and simple solids. Student will be able to convert given isometric views into orthographic views. Students will be able to apply various concepts to solve practical problems related to engineering
CO6	draw objects using draw and modify toolbars of AutoCAD
Course Code: 18ECPHL1050	
Course Title: ENGINEERING PHYSICS LABORATORY	
CO1	Determine the electrostatic field and static potentials.
CO2	Apply the Biot- Savart's law in case of circular coils.
CO3	Determine the self-inductance of a coil.
CO4	Measure value of a charged particle in electrical
Course Code: 18CMCSL1060	
Course Title: PROGRAMMING FOR PROBLEM SOLVING LAB	
CO1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solving problems.
CO2	Examine and analyze alternative solutions to a problem.
CO3	Design an algorithmic solution to a problem using problem decomposition and step-wise refinement.
CO4	Demonstrate conversion of iterative function store cursive and vice-versa.
CO5	Implement the concepts of arrays.
CO6	Implement the structures, Unions and files.
Course Code: 18CMMEL 1070	
Course Title: WORKSHOP/MANUFACTURING PRACTICE	
CO1	Make use of basic carpentry joints to make furniture.
CO2	Fabricate mechanical engineering assemblies using fitting joints.
CO3	Produce various machine components by using foundry, black smithy, machining and plastic molding techniques.
Course Code: 18CMCHN1080	
Course Title: ENVIRONMENTAL SCIENCE	
CO1	Know the importance of environmental studies and the measures to be taken to overcome global environmental challenges.
CO2	Understand the concept of eco system and its diversity.
CO3	Gain knowledge on natural resources.
CO4	Understand the concept of biodiversity.
CO5	Gain knowledge on environmental pollution.
CO6	Gain knowledge on environmental legislation and global treaties.
Course Outcomes for First Year Second Semester Course	

Course Code: 18CMEGT2010	
Course Title: TECHNICAL ENGLISH	
CO1	Ability to understand Scientific vocabulary and use them confidently
CO2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO3	Ability to write error free simple technical passages
CO4	Knowledge of writing different writing styles
CO5	Confidence to write letters and technical reports clearly and coherently
CO6	Get inspired by achievements and values upheld by a renowned technocrat.
Course Code: 18CMMAT2020	
Course Title: ENGINEERING MATHEMATICS-II	
CO1	Solve system of linear equations
CO2	Find eigen values and eigen vectors of a matrix
CO3	Solve initial value problems by using Laplace transforms
CO4	Find the solution of algebraic/transcendental equations and also interpolate the functions.
CO5	Evaluate numerical integration and to solve ordinary differential equations by using numerical methods.
CO6	Find Fourier series of a periodic function and to determine the Fourier transform of a function
Course Code: 18CMCHT2030	
Course Title: ENGINEERING CHEMISTRY	
CO1	Rationalize periodic properties like ionization potential, electro negativity and oxidation states.
CO2	Know the nature and working of various electrodes.
CO3	Analyze bulk properties and processes using thermodynamic considerations.
CO4	Synthesize organic molecules using different types of chemical reactions.
CO5	Understand the concepts of atomic and molecular orbital's.
CO6	Gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used forexciting different molecular energy levels.
Course Code: 18CMEET2040	
Course Title: BASIC ELECTRICAL ENGINEERING	
CO1	Analyze DC Circuits By Using KCL, KVL And Network Theorems
CO2	Analyze AC Circuits
CO3	Explain The Operation And Compute Performance Of Transformer
CO4	Explain The Construction And Working Of Rotating Electrical Machines
CO5	Describe DC-DC And DC-AC Converters
CO6	Able To Explain About Types Of LV Switch Gear And Types Of Batteries
Course Code: 18CMEGL2050	
Course Title: ENGLISH LANGUAGE COMMUNICATION SKILLS LAB	

CO1	acquire basic Proficiency in English by practicing the Listening Comprehension
CO2	acquire basic Proficiency in English by practicing the Pronunciation
CO3	acquire basic Proficiency in English by practicing the Dialogues
CO4	acquire basic Proficiency in English by practicing the Interpersonal Communication Skills
CO5	Acquire Basic Proficiency In English By Practicing The Presentation Skills
CO6	Acquire Basic Proficiency In English By Practicing The Discussions And Debates
Course Code: 18CMCHL2060	
Course Title: ENGINEERING CHEMISTRY LABORATORY	
CO1	Measure Molecular Properties Like Surface Tension And Viscosity
CO2	Determine Chloride Content Of Given Water Sample.
CO3	Synthesize A Drug.
CO4	Determine Rate Constant As A Function Of Time.
CO5	Determine Strength Of Acids Using Conductivity Meter.
CO6	Determine Amount Of Fe (II) Using Potentiometer.
Course Code:18CMEEL2070	
Course Title: BASIC ELECTRICAL ENGINEERING LAB	
CO1	Determine The Time Response And Resonance Of Given RL, RC And RLC Circuits
CO2	Determine The Response Using Superposition, Norton And Thevinins.
CO3	Determine The Power, Efficiency AndRegulation Of Ac Machines
Course Code:18CMMSN2080	
Course Title: CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS	
CO1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
CO2	Understand state and central policies, fundamental duties.
CO3	Understand Electoral Process, special provisions.
CO4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies.
CO5	Understand Engineering ethics and responsibilities of Engineers
CO6	Understand Engineering Integrity &Reliability
Course Outcomes for Second Year First Semester Course	
Course Code: 18CMMAT3010	
Course Title: ENGINEERING MATHEMATICS – III	
CO1	Find the function of a complex variable
CO2	Evaluate complex integration and expand functions using Taylor & Maclaurin's series
CO3	Evaluate integrals using Residues
CO4	Find the statistical parameters for discrete distributions

CO5	Find the statistical parameters for continuous distributions
CO6	Test the hypothesis
Course Code: 18ECECT3020	
Course Title: ELECTRONIC DEVICES	
CO1	Understand the basic concepts of semiconductor physics.
CO2	Understand the construction and operating principle of p-n junction diode and special semiconductordiodes
CO3	diodes as rectifiers and analyze characteristics with and without filters
CO4	Understand the construction and principle of operation of BJT and FET w.r.t V-I characteristics.
CO5	Analyze various biasing techniques for BJT and FET.
CO6	Analyze BJT and FET using small signal analysis
Course Code: 18ECECT3030	
Course Title: NETWORK ANALYSIS	
CO1	Analyze basic electrical networks using mesh, nodal techniques.
CO2	Analyzebasicelectricalnetworksusingtopologicaldescriptionofthenetwork.
CO3	Apply and analyze various network theorems for DC and AC circuits.
CO4	Analyze the transient response of R-L, R-C and R-L-C networks
CO5	Analyze two port networks.
CO6	Analyze the characteristics of Filters and Attenuators.
Course Code: 18ECECT3040	
Course Title: SIGNALS & SYSTEMS	
CO1	Understand various signals and systems and demonstrate their properties.
CO2	Interpret Fourier analysis of continuous-time Signals.
CO3	Apply samplingtheoremforsignalconversionfromcontinuous-timesignalsto discrete-time.
CO4	Analyze continuous time signals by using Laplace transforms
CO5	Understand various operations on LTI systems
CO6	Apply z-transform to analyze discrete-time signals and systems
Course Code: 18ECECT3050	
Course Title: PROBABILITY & STOCHASTIC PROCESSES	
CO1	Understand the axiomatic formulation of Probability Theory
CO2	Demonstrate the concept of random variable and its distribution, density functions
CO3	Apply statistical operations and transformations on 1-D random variable
CO4	Extend the concept of 1-D random variable to multiple random variables
CO5	Analyze random processes by understanding its temporal and Spectral characteristics

CO6	Analyze linear Time Invariant systems with random inputs
Course Code: 18ECECL3060	
Course Title:ELECTRONIC DEVICES LAB	
CO1	Analyze the characteristics of Semiconductor devices.
CO2	Design and verify the biasing circuit for BJT
CO3	Design and analyze BJT and FET Amplifier Circuits
Course Code:18ECECL3070	
Course Title:NETWORK ANALYSIS LAB	
CO1	Analyze complex DC and AC linear circuits
CO2	Apply concepts of electrical circuits across engineering
CO3	Analyze the given electrical network by using PSPICE Simulation tool
Course Code:18ECECL3080	
Course Title:PULSE & DIGITAL CIRCUITS LAB	
CO1	Analyze linear wave shaping circuits with different inputs.
CO2	Design Nonlinear wave shaping circuits.
CO3	Design switching circuits.
CO4	Analyze different Multivibrators
CO5	Design different multivibrators
CO6	Understand different types of time base generators
Course Outcomes for Second Year Second Semester Course	
Course Code:18ECECT4010	
Course Title:DIGITAL SYSTEM DESIGN	
CO1	Understand the basic number systems, conversions and Boolean algebra.
CO2	Design digital systems using combinational circuits
CO3	Design digital systems using sequential circuits
CO4	Understand the concepts of logic families and corresponding logic levels
CO5	DesigndigitalsystemusingPLDsandUnderstandtheconstructionandworkingof memories
CO6	Design digital systems using VHDL
Course Code:18ECECT4020	
Course Title:ENGINEERING MECHANICS	
CO1	Able to Resolve the forces into components, moment of force and its applications
CO2	Construct free body diagrams and develop appropriate equilibrium equations
CO3	Determine Centroid and moment of inertia for composite areas.
CO4	Determine the kinematic relations of particles &rigid bodies
CO5	Apply equations of motion to particle and rigid body.
CO6	Analyze motion of particles & rigid bodies using the principle of energy and momentum

Course Code:18ECECT4030	
Course Title:EM WAVES & TRANSMISSION LINES	
CO1	Analyze wave equations in different mediums
CO2	Understand the reflection and refraction mechanism of plane waves with normal and oblique incidences
CO3	Demonstrate types of transmission lines and its fundamental characteristics
CO4	Apply the characteristics of transmission lines to analyze the impedance matching
CO5	Understand TE/TM/TEM modes of propagation in rectangular waveguides
CO6	Demonstrate the working mechanism of Micro strip and cavity resonators
Course Code:18ECECT4040	
Course Title:ANALOG CIRCUITS	
CO1	Analyze and design single and multi-stage amplifiers at low, mid and high frequencies.
CO2	Understand the concept of feedback and design different oscillator circuits.
CO3	Analyze and design different types of feedback amplifiers
CO4	Design different Power amplifiers and evaluating the efficiency
CO5	Demonstrate linear and non-linear applications of operational amplifiers
CO6	Demonstrate 555 timer applications and different Data Converters
Course Code:18ECECT4050	
Course Title:ANALOG & DIGITAL COMMUNICATIONS	
CO1	Understand the concept of modulation and amplitude modulation.
CO2	Differentiate various schemes of amplitude modulation and demodulation techniques.
CO3	Understandthefundamentalsofanglemodulationanddemodulationtechniques.
CO4	Extend the various analog modulation schemes for pulse carrier
CO5	Establish various pulse modulation schemes in digital domain
CO6	Interpret probability error for digital modulation techniques
Course Code:18ECECL4060	
Course Title:DIGITAL SYSTEM DESIGN LAB	
CO1	Design digital systems using combinational circuit's using VHDL.
CO2	Design digital systems using sequential circuit's using VHDL
CO3	Design Memories using VHDL
Course Code:18ECECL4070	
Course Title:ANALOG CIRCUITS LAB	
CO1	Design two stage amplifier and analyze frequency response at low, mid and high frequencies.
CO2	Design feedback amplifier and analyze its frequency response
CO3	Design different oscillator circuits and evaluate its frequency of oscillation
CO4	Design different Power amplifiers and evaluate the efficiency
CO5	Design linear and non-linear applications of operational amplifiers

Course Code:18ECECL4080	
Course Title:ANALOG & DIGITAL COMMUNICATIONS LAB	
CO1	Infer the modulation and demodulation techniques for continuous wave.
CO2	Apply the sampling theorem.
CO3	Analyze the modulation and demodulation techniques for pulse carrier
Course Outcomes for Third Year First Semester Course	
Course Code:18CMMST5010	
Course Title: MANAGEMENT SCIENCE	
CO1	Define the Basic Concepts of Management and organization
CO2	Summarize the Statistical Quality Control Techniques, Methods of inspection, the concept of InventoryManagement and Control
CO3	Identify the Customer Behavior and Employees Contribution towards success of Organization
CO4	Apply the techniques of project management to complete the project within the duration and cost
CO5	Identify the various types of strategies for organizational development
Course Code:18ECECT5020	
Course Title: CONTROL SYSTEMS	
CO1	Characterize a control system and Develop mathematical model of the physical systems.
CO2	Apply time response analysis on first and second order systems
CO3	Analyze the system stability using Routh Hurwitz and Root locus techniques
CO4	Analyze the system stability using frequency response analysis
CO5	Apply state variable analysis to continuous time systems and obtain the relationship between statevariable representation and transfer functions.
Course Code:18ECECT5030	
Course Title:COMPUTER ARCHITECTURE & ORGANIZATION	
CO1	Understand about computer systems
CO2	Learn number systems, binary addition and subtraction, standard, floating-point, and micro operations
CO3	understanding of architecture and functionality of central processing unit
CO4	Know I/O and memory organization
CO5	Illustrate concepts of parallel processing, pipelining and inter processor communication
Course Code:18ECECT5040	
Course Title:MICROPROCESSOR AND MICROCONTROLLERS	
CO1	Understand the internal operation and programming concepts of 8086 microprocessor
CO2	Apply the interfacing concepts of 8086 with memory and other peripherals.
CO3	Applying the interfacing concepts of 8086 with basic hardware components
CO4	Interpret the concept of 8051 microcontrollers internal architecture like Timer/Counter, I/O ports,memory interfacing.
CO5	Apply the programming model of 8051 Microcontroller using embedded C.
Course Code:18ECECT5050	
Course Title:DIGITAL SIGNAL PROCESSING	
CO1	Illustrate the Discrete time signals and systems.
CO2	Apply the FFT algorithm for solving the DFT of a given signal.

CO3	Construct a Digital IIR and FIR filter for the given specifications
CO4	Apply Multi-rate signal Processing concepts in various applications
CO5	Apply the signal processing concepts on DSP Processor
Course Code:18ECECP506A	
Course Title:ANTENNAS AND WAVE PROPAGATION	
CO1	To demonstrate the fundamentals and basics of Antennas with its working principle
CO2	To recognize the importance of Retarded potentials of antenna and Wire Antenna Analysis
CO3	Analyze the various antenna arrays with their design considerations
CO4	Design VHF and UHF Antennas and illustrate their working principle
CO5	Analysis wave propagation modes and their characteristics
Course Code:18ECECP506B	
Course Title:INFORMATION THEORY & CODING	
CO1	Understand the concept of Information theory.
CO2	Analyze various source coding algorithms.
CO3	Model the continuous and discrete communication channels.
CO4	Construct the encoding and decoding circuits for Linear Block codes
CO5	Construct the encoding and decoding circuits for cyclic and convolution codes.
Course Code:18ECECP506C	
Course Title:SYSTEM DESIGN THROUGH VERILOG	
CO1	Demonstrate knowledge on HDL design flow and identify the suitable abstraction level of a particulardesign
CO2	Memorizing the constructs and conventions used for Verilog programming
CO3	Design and develop the combinational and sequential circuits using dataflow modeling
CO4	Implement sequential logic circuits using behavioral modeling
CO5	Writing the programs more effectively using tasks and functions
Course Code:18ECECL5070	
Course Title:MICROPROCESSORS AND MICROCONTROLLERS LAB	
CO1	Perform the Arithmetic and logic operations with 8086 processors.
CO2	Learn the various interfacing concepts with 8086 processors
CO3	Design a real time clock with modern microcontroller boards
CO4	Learn the various interfacing mechanisms with modern microcontroller boards.
CO5	Compile, design and test a simple microcontroller based system with their programming models .
Course Code:18ECECL5080	
Course Title:DIGITAL SIGNAL PROCESSING LAB	
CO1	Illustrate the fundamental discrete time signals
CO2	Experiment with the properties of an LTI system
CO3	Construct a Digital IIR filter for the given specifications
CO4	Construct a Digital FIR filter for the given specifications
CO5	Apply basic building blocks of Multi-rate signal processing
Course Code:18CMAHS5090	
Course Title:SOFT SKILLS & APTITUDE BUILDER – 1	

CO1	Re-engineer attitude and understand its influence on behaviour
CO2	Develop interpersonal skills and be an effective goal oriented team player
CO3	Develop holistic personality with a mature outlook to function effectively in different circumstances
CO4	Solve the real-time problems for performing job functions easily
CO5	Analyse the problems logically and critically
Course Code:18CMMSN50A0	
Course Title:BIOLOGY FOR ENGINEERS	
CO1	Able to describe how biological observations of 18th Century that lead to major discoveries.
CO2	Able to convey that classification per se is not what biology is all about but highlight the underlyingcriteria, such as morphological, biochemical and ecological
CO3	Able to demonstrate the highlight the concepts of recessiveness and dominance during the passage ofgenetic material from parent to offspring.
CO4	Able to convey that all forms of life have the same building blocks and yet the manifestations are asdiverse as one can imagine.
CO5	Able to classify enzymes and distinguish between different mechanisms of enzyme action.
Course Outcomes for Third Year Second Semester Course	
Course Code:18ECECT6010	
Course Title:VLSI DESIGN	
CO1	Understand the introduction and basic electrical properties of MOS and BiCMOS circuits.
CO2	Understand the intricacies of VLSI Circuit design processes.
CO3	Analyze the parametric for CMOS Circuits
CO4	Analysis of VLSI design methodologies
CO5	Understand design for Manufacturability and Testability
Course Code:18ECECT6020	
Course Title:COMPUTER NETWORKS	
CO1	Summarize different type reference models, topologies and networks and functions of physical layer
CO2	Analyze various data link layer protocols
CO3	Demonstrate about different Routing Algorithms in Computer Networks
CO4	Analyze transport layer services and protocols
CO5	Interpret network security and computer network applications
Course Code:18ECECP603A	
Course Title:EMBEDDED SYSTEM DESIGN	
CO1	Understand the fundamentals of the embedded systems.
CO2	Know the hardware details of the embedded systems.
CO3	Learn concept of firmware design approaches, Interrupt concept.
CO4	Learn about the various embedded software development tools
CO5	Understand the embedded system design life cycle and co-design issues

Course Code:18ECECP603B	
Course Title:DESIGN FOR TESTABILITY	
CO1	Apply the concepts in testing which can help them design a better yield in IC design
CO2	Identify the design for testability methods for combinational & sequential CMOS circuits.
CO3	Analyze the various test generation methods for static & dynamic CMOS circuits
CO4	Recognize the BIST techniques for improving testability
CO5	Tackle the problems associated with testing of memory BIST and compression models
Course Code:18ECECP603C	
Course Title:ADVANCED DIGITAL SIGNAL PROCESSING	
CO1	Apply DFT and FFT on the given discrete time signal.
CO2	Outline the basics of multirate digital signal processing
CO3	Analyze the power spectrum estimation
CO4	Construct the digital IIR and FIR filters.
CO5	Analyze the Finite word length effects in Fixed point DSP Systems
Course Code:18ECECP604A	
Course Title:MICROWAVE ENGINEERING	
CO1	To understand microwave transmission lines
CO2	To analyze various microwave passive components with their working
CO3	To analyze various microwave O-type tubes
CO4	To analyze various M Type microwave vacuum tubes
CO5	To study the importance of microwave measurements
Course Code:18ECECP604B	
Course Title:INTERNET PROTOCOLS	
CO1	Understand ARP and IP
CO2	Understand ICMPV4 and ICMPV6
CO3	Analyze DNS and Name Resolution
CO4	Describe TCP Data Flow and Window Management
CO5	Analyze Simulation of Network Protocols Using different software for simulation.
Course Code:18ECECP604C	
Course Title:DIGITAL IMAGE PROCESSING	
CO1	Interpret the fundamentals of digital image processing and apply various transforms on digital images. .
CO2	Apply filtering concepts in spatial and frequency domains
CO3	Analyze digital images using compression algorithms
CO4	Classify the color models and interpret the Morphological image processing concepts to gray scale images.
CO5	Apply various segmentation algorithms on digital images
Course Code:18ECECL6070	

Course Title:VLSI DESIGN LAB	
CO1	Design CMOS logic circuits.
CO2	Design and simulation of Combinational and Sequential CMOS
CO3	Generation and verification of layouts for combinational CMOS Circuits.
CO4	Generation and verification of layouts for sequential CMOS Circuits
CO5	Design and analysis of DRC and LVS for CMOS
Course Code:18ECECL6080	
Course Title:COMPUTER NETWORKS LAB	
CO1	Construct the stack, Queue and their applications using Arrays.
CO2	Apply Linked list concepts to implement the stack, Queue and their applications.
CO3	Develop different framing methods and error control mechanisms of Data link layer
CO4	Develop routing algorithms of Network layer
CO5	Construct transport layer applications
Course Code:18CMAHS6090	
Course Title:SOFT SKILLS & APTITUDE BUILDER – 2	
CO1	learn and practice effective communication skills
CO2	develop broad career plans, evaluate the employment market, and become industry ready
CO3	develop accuracy on time and distance and units related solutions
CO4	solve the real-time problems for performing job functions easily
CO5	solve problems related to permutations and combinations, probability, areas and volumes
Course Outcomes for Fourth Year First Semester Course	
Course Code:18CMMST7010	
Course Title: ENGINEERING ECONOMICS & FINANCIAL MANAGEMENT	
CO1	Define the basic concepts of managerial economics, demand, and demand forecasting techniques
CO2	Apply the techniques of production and able to analyze the cost concepts
CO3	Identify various market structures & pricing policies and Identify various formats of business-like sole trader, partnership, joint stock etc.,
CO4	Apply the concepts of financial accounting to estimate profit or loss of a firm
CO5	Apply the different techniques of capital budgeting to take investment decisions
Course Code:18ECECT7020	
Course Title:ELECTRONICS MEASUREMENTS AND INSTRUMENTATION	
CO1	Understand the performance characteristic of instruments
CO2	Understand the functional characteristics of voltmeter and ammeter
CO3	Understand signal generator’s features
CO4	Analyze the variants of AC Bridges
CO5	Understand the features and functionalities of transducers
Course Code:18ECECP703A	

Course Title: EMBEDDED & REAL TIME CONCEPTS	
CO1	Review basic operation of the Real Time Embedded Systems.
CO2	Describe the various communication models used in Embedded application
CO3	Understand various Embedded System design computing models
CO4	Describe the concepts of Real Time Operating Systems.
CO5	Demonstrate the fundamentals of Embedded Linux concepts
Course Code:18ECECP703B	
Course Title: LOW POWER VLSI	
CO1	Locate various power consumption sources in ICs.
CO2	Calculate various power consumption parameters using statistical methods.
CO3	Understand issue at various stages of low power design.
CO4	Develop architecture and system using low power design constraints.
CO5	Apply clock distribution network to applications targeting low power dissipation
Course Code:18ECECP703C	
Course Title:CELLULAR & MOBILE COMMUNICATIONS	
CO1	Understand operation of cellular systems
CO2	Understand the concepts of cellular communication
CO3	Understand the cell coverage for signal and traffic
CO4	Acquire the knowledge of cell diversity in antennas.
CO5	Understand Concept of Handoff, types of hand-offs
Course Code:18ECECP704A	
Course Title: RADAR SYSTEMS	
CO1	Understand the basis for RADAR Systems
CO2	Understand various parameters associated with radars
CO3	study the characteristics of CW and FM radar
CO4	study the characteristics of MTI and pulse Doppler
CO5	understand tracking of radars
Course Code:18ECECP704B	
Course Title: WIRELESS SENSOR NETWORKS	
CO1	understand Cellular and Adhoc networks in detail
CO2	understand wireless sensor networks design and principles
CO3	understand various MAC protocols for sensor networks
CO4	understand and analyze various routing techniques of WSN and ad hoc networks
CO5	Understand Low duty cycle and wake up concepts
Course Code:18ECECP704C	
Course Title: COMPUTER VISION AND IMAGE PROCESSING	

CO1	Interpret the basics of Computer Vision and image formation
CO2	Apply feature detection concepts on images.
CO3	Illustrate fundamentals of pattern recognition and parameter estimation
CO4	Construct neural networks related to pattern classification
CO5	Analyze applications of computer vision and pattern recognition
Course Code:18ECECS707	
Course Title: INTERNET OF THINGS AND ITS APPLICATIONS	
CO1	Understand the concepts of Arduino Uno and different types of I/O Devices.
CO2	Develop Embedded C programs for different applications using Arduino Uno
CO3	Construct interfacing circuits for different Applications using Raspberry Pi
CO4	Develop Python codes for different applications using Raspberry Pi
CO5	Develop Real time Embedded System applications using IoT
Course Code:18ECECS7070	
Course Title: MICROWAVE CIRCUITS AND ANTENNA DESIGN USING HFSS	
CO1	Analyze various microstrip transmission lines
CO2	Design and Analyse half-wave and quarter-wave wire antennas.
CO3	Design and analyse microstrip patch antennas using different feeding techniques
CO4	Design and analyse dual band microstrip antennas
CO5	Design and analyse frequency reconfigurable antennas

SITE 18 Course Outcomes

B. TECH- COMPUTER SCIENCE ENGINEERING

Course Outcomes for First Year First Semester Course	
Course Code: 18CMMAT101 0	
Course Title: ENGINEERING MATHEMATICS-I	
CO-1	Solve first order differential equations
CO-2	Solve linear differential equations with constant coefficients
CO-3	Find the extreme of a function
CO-4	Solve partial differential equations
CO-5	Evaluate multiple integrals
CO-6	Verify vector integral theorems
Course Code: 18ITPH1020	
Course Title: ENGINEERING PHYSICS	
CO-1	Explain the conducting mechanism in metals
CO-2	Estimate the concentration of charge carriers
CO-3	Describe light-semiconductor interaction
CO-4	Illustrate the working function of LEDs and diode lasers
CO-5	Illustrate the working function of photo detectors
CO-6	Illustrate the working function of solar cells
COURSE CODE: 18CMCST1030	
COURSE TITLE: PROGRAMMING FOR PROBLEM SOLVING	
CO-1	Formulate algorithms, translate them into programs and correct program errors
CO-2	Choose right control structures suitable for the problem to be solved
CO-3	Decompose reusable code in a program into functions (Iterative and recursive)
CO-4	Use arrays, pointers, structures and unions appropriately
CO-5	Explain Memory allocation strategies
CO-6	Store and Retrieve data from permanent storage
COURSE CODE: 18CMMEL1040	
COURSE TITLE: ENGINEERING GRAPHICS	
CO-1	Construct Polygons using general methods, inscribe and describe polygons on circles, draw curves (parabola, ellipse and hyperbola, cycloids, involutes) by generalmethods
CO-2	Read, Interpret and Construct plain scales, diagonal scales and Vernier scales
CO-3	Draw orthographic projections of points, lines, Planes & Solids inclined to onereference plane and apply these concepts to solve practical problems related to engineering
CO-4	Draw sections and sectional views of Solids
CO-5	Draw isometric view of lines, plane figures and simple solids, Convert given isometric views into orthographic views, and apply these concepts to solve practicalproblems related to engineering
CO-6	Draw objects using draw and modify toolbars of AutoCAD

COURSE CODE: 18ITPHL1050	
COURSE TITLE: ENGINEERING PHYSICS LABORATORY	
CO-1	Understand the existence of the energy levels in gases
CO-2	Study the resistivity variation with temperature in conductor
CO-3	Determine the energy band gap of semiconductor diode
CO-4	Understand the phenomenon of Hall Effect
CO-5	Understand the interaction of the light with semiconductor
CO-6	Study the characteristic curves of the LEDs, Laser diode & Solar cells
COURSE CODE: 18CMCSL1060	
COURSE TITLE: PROGRAMMING FOR PROBLEM SOLVING LAB	
CO-1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solving problems
CO-2	Examine and analyze alternative solutions to a problem
CO-3	Design a solution to a problem using problem decomposition and step-wiserefinement
CO-4	Demonstrate conversion of iterative functions to recursive and vice-versa
CO-5	Demonstrate usage of arrays, structures and unions
CO-6	Demonstrate reading from and writing to files along with simple file operations
COURSE CODE: 18CMMEL1070	
COURSE TITLE: WORKSHOP/MANUFACTURING PRACTICE	
CO-1	Make use of basic carpentry joints to make furniture
CO-2	Fabricate mechanical engineering assemblies using fitting joints
CO-3	Produce various machine components by using foundry, black smithy, machiningand plastic molding techniques
COURSE CODE18CMCHN1080	
COURSE TITLE: ENVIRONMENTAL SCIENCE	
CO-1	Explain importance of Environmental studies and the measures to be taken to overcome global environmental challenges
CO-2	Describe the concept of ecosystem and its diversity
CO-3	Describe knowledge on natural resources
CO-4	Explain concept of biodiversity
CO-5	Explain knowledge on environmental pollution
CO-6	Debate knowledge on environmental legislation and global treaties
COURSE OUTCOMES FOR FIRST YEAR SECOND SEMESTER COURSE	
COURSE CODE : 18CMEGT2010	
COURSE TITLE: TECHNICAL ENGLISH	
CO-1	Use scientific vocabulary confidently
CO-2	Apply basic principles of writing clear sentences and paragraphs
CO-3	Writeerror free simple technical passages
CO-4	Frame sentences corresponding to different writing styles
CO-5	Confidently write clear and coherent letters and technical reports
CO-6	Convert inspirations in the form of achievements and values upheld by renownedtechnocrats to write-ups
COURSE CODE 18CMMAT2020	

COURSE TITLE: ENGINEERING MATHEMATICS-II	
CO-1	Solve system of linear equations and find eigen values and eigen vectors of a matrix
CO-2	Solve initial value problems by using Laplace transforms
CO-3	Find the solution of algebraic/transcendental equations and also interpolate theFunctions
CO-4	Evaluate numerical integration and to solve ordinary differential equations by usingnumerical methods
CO-5	Find Fourier series of a periodic function and to determine the Fourier transform of aFunction
COURSE CODE : 18CMCHT2030	
COURSE TITLE :ENGINEERING CHEMISTRY	
CO-1	Rationalize periodic properties like ionization potential, electro negativity andoxidation states
CO-2	Describe the nature and working of various electrodes
CO-3	Analyze bulk properties and processes using thermodynamic considerations
CO-4	Synthesize organic molecules using different types of chemical reactions
CO-5	Explain the concepts of atomic and molecular orbitals
CO-6	Gain knowledge on spectroscopic techniques and the ranges of the electromagneticspectrum used for exciting different molecular energy levels
COURSE CODE : 18CMEET2040	
COURSE TITLE : BASIC ELECTRICAL ENGINEERING	
CO-1	Analyze DC circuits by using KCL, KVL and Network theorems
CO-2	Analyze AC circuits
CO-3	Explain the operation and compute performance of transformer
CO-4	Explain the construction and working of rotating electrical machines
CO-5	Describe DC-DC and DC-AC converters
CO-6	Explain about types of LV switch gear and types of batteries
COURSE CODE : 18CMEGL2050	
COURSE TITLE : ENGLISH & COMMUNICATION SKILLS LABORATORY	
CO-1	Improve listening comprehension
CO-2	Pronounce words and sentences correctly
CO-3	Dialogue with others
CO-4	Upgrade interpersonal communication skills
CO-5	Present ideas/concepts to audience
COURSE CODE : 18CMCHL2060	
COURSE TITLE : ENGINEERING CHEMISTRY LABORATORY	
CO-1	Measure molecular properties like surface tension and viscosity
CO-2	Determine chloride content of water of given water sample
CO-3	Synthesize a drug
CO-4	Determine rate constant as a function of time
CO-5	Determine strength of acids using conductivity meter
CO-6	Determine amount of Fe (II) using potentiometer
COURSE CODE : 18CMEEL2070	
COURSE TITLE : BASIC ELECTRICAL ENGINEERING LABORATORY	

CO-1	Know the importance of measuring instruments
CO-2	Determine the response and resonance of given RL, RC and RLC circuits
CO-3	Determine the voltage, current and performance characteristics of a single-phase Transformer
CO-4	CO Determine the speed torque characteristics of dc shunt motor
CO-5	CO Determine the breakdown voltage of PN junction diode
CO-6	CO Determine the ripple factor for half wave and full wave rectifier with and withoutfilter
COURSE CODE : 18CMMSN2080	
COURSE TITLE : CONSTITUTION OF INDIA, PROFESSIONAL ETHICS &HUMAN RIGHTS	
CO-1	Have general knowledge and legal literacy and thereby to take up competitive Examinations.
CO-2	Understand state and central policies, fundamental duties
CO-3	Understand Electoral Process, special provisions
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operativesocieties
CO-5	Understand Engineering ethics and responsibilities of Engineers
CO-6	Understand Engineering Integrity & Reliability
Course Outcomes for Second Year First Semester Course	
Course Code:18CMMAT3010	
Course Title: ENGINEERING MATHEMATICS-III	
CO-1	Find the function of a complex variable
CO-2	Evaluate complex integration and expand functions using Taylor & McLaren's series
CO-3	Evaluate integrals using Residues
CO-4	Find the statistical parameters for discrete & Continuous distributions
CO-5	Test the Hypothesis
Course Code:18CSECT3020	
Course Title: DIGITAL ELECTRONICS	
CO-1	DESCRIBE fundamental gates in digital circuits. Examine the structure of numbersystems and convert different type of codes and number systems which are used in digital communication and computer systems.
CO-2	DIFFERENCIATE different logic families. Compare different types of logic familieswhich are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.
CO-3	ILLUSTRATE the simplification methods of Boolean algebra. Illustrate reduction of logical expressions using Boolean algebra, k-map and tabulation method andimplement the functions using logic gates.
CO-4	DEMONSTARATE the sequential circuits & systems and design different types of with and without memory element digital electronic circuits and with operation ofA/D and D/A converters.
CO-5	DISCUSS Semiconductor memories and Programmable logic devices. Assess the nomenclature and technology in the area of memory devices and apply the memory devices in different types of digital circuits for real world application. Implement combinational logic circuits using programmable logic devices.
Course Code:18CSECT3030	
Course Title: ANALOG ELECTRONIC CIRCUITS	
CO-1	Understand the characteristics of diode and analyze the rectifier, clipping andclamping circuits.
CO-2	Understand the construction and principle of operation of BJT with respect to V-Icharacteristics.
CO-3	Understand the concept of MOSFET and analyze the circuits and its characteristics.

CO-4	Classify and explain different types of amplifier
CO-5	Understand the design of linear and non-linear applications of Op-Amp.
Course Code: 18CSCST3040	
Course Title: DISCRETE MATHEMATICS	
CO-1	Inferring Conclusion from set of premises in Propositional Logic & Predicate Logic.
CO-2	Solving congruence problems and larger exponentiation problems using numbertheorems
CO-3	Interpret terminology, operations and mathematical models using theories of sets,relations and functions.
CO-4	Apply permutations & Combinations for basics of computing.
CO-5	Illustrate basic properties of algebraic structures.
Course Code: 18CSCST3050	
Course Title: DATA STRUCTURES	
CO-1	Analyze algorithm's time and space complexity and justify the correctness.
CO-2	Implement Stack and Queue ADT.
CO-3	Implement Linked List ADT.
CO-4	Implement Binary Tree ADT and traversal algorithms.
CO-5	Implement Graph ADT and BFS and DFS traversal algorithms.
Course Code: 18CSECL3060	
Course Title: ANALOG & DIGITAL CIRCUITS LAB	
CO-1	Understand the characteristics of semiconductor devices
CO-2	Understand the nature of transistor and FET amplifier
CO-3	Demonstrate the functionality of logic gates
CO-4	Design and Demonstrate the functionality of combinational circuits
CO-5	Design and Demonstrate the functionality of sequential logic circuits
Course Code: 18CSCSL3070	
Course Title: IT WORK SHOP LAB	
CO-1	Understand the need for simulation/implementation for the verification of mathematical functions.
CO-2	Understand the main features of the SCILAB program development environment toenable their usage in the higher learning.
CO-3	Understand control flow of the program
CO-4	Implement simple mathematical functions/equations in numerical computingenvironment such as SCILAB.
CO-5	Interpret and visualize simple mathematical functions and operations thereon usingplots/display.
Course Code: 18CSCSL3080	
Course Title: DATA STRUCTURES LAB	
CO-1	Analyze algorithm's time and space complexity and justify the correctness.
CO-2	Implement Stack and Queue ADT.
CO-3	Implement Linked List ADT.
CO-4	Implement Binary Tree ADT and traversal algorithms.
CO-5	Implement Graph ADT and BFS and DFS traversal algorithms.

Course Outcomes for Second Year Second Semester Course	
Course Code: 18CSECT4010	
Course Title: SIGNALS & SYSTEMS	
CO-1	Able to Classify the signals and systems
CO-2	Able to demonstrate the Behavior of continuous and discrete-time LTI systems
CO-3	Able to Analyze the continuous-time signals and systems using relevant transforms
CO-4	Able to Apply z-transform to analyze discrete-time signals and systems
CO-5	Able to Apply sampling theorem to convert CT signals to DT signals and itsreconstruction.
Course Code: 18CMCET4020	
Course Title: ENGINEERING MECHANICS	
CO-1	Calculate the System of forces into components, moment of force and its applications
CO-2	Examine free body diagrams and write appropriate equilibrium equations.
CO-3	Evaluate the centroid and moment of inertia for composite areas.
CO-4	Apply the kinematic relations of particles, rigid bodies for equations of motion
CO-5	Analyze motion of particles & rigid bodies using the principle of energy andmomentum methods.
Course Code: 18CSCST4030	
Course Title: COMPUTER ORGANIZATION	
CO-1	Model the concepts of Functional units, Number representations and various methodsfor performing Integer arithmetic on computer system.
CO-2	Illustrate the various instruction sets and addressing modes
CO-3	Design a control unit for basic computer.
CO-4	Analyze the principles of memory organization and accessing I/O devices
CO-5	Understand pipelining techniques and instruction level parallelism
Course Code: 18CSCST4040	
Course Title: ALGORITHM & DESIGN ANALYSIS	
CO-1	Apply dynamic programming ,greedy strategy techniques to solve the problems
CO-2	Apply algorithm design principles to derive solutions for real life problems
CO-3	Interpret major graph algorithms to model engineering problems
CO-4	Demonstrate variations among tracable and intracable problems
CO-5	Apply various approximations and Randomized Algorithms, When an algorithmicdesign situation calls for it
Course Code: 18CSCST4050	
Course Title: JAVA PROGRAMMING	
CO-1	Build software development skills using java programming for real worldapplications.
CO-2	Implement basic problems using Java.
CO-3	Make use of multithreading concepts to handle exceptions.
CO-4	Develop programs using java collection API as well as java Standard Library.
CO-5	Develop Graphical User Interface applications using JavaFX.

Course Code: 18CSCSL4060	
Course Title: COMPUTER ORGNAIZATION LAB	
CO-1	Model the concepts of Functional units, Number representations and various methods for performing Integer arithmetic on computer system.
CO-2	Illustrate the various instruction sets and addressing modes
CO-3	Design a control unit for basic computer.
CO-4	Analyze the principles of memory organization and accessing I/O devices
CO-5	Understand pipelining techniques and instruction level parallelism
Course Code: 18CSCSL4070	
Course Title: ALGORITHM & DESIGN ANALYSIS LAB	
CO-1	Apply dynamic programming ,greedy strategy techniques to solve the problems
CO-2	Apply algorithm design principles to derive solutions for real life problems
CO-3	Interpret major graph algorithms to model engineering problems
CO-4	Demonstrate variations among tracable and intracable problems
CO-5	Apply various approximations and Randomized Algorithms, When an algorithmicdesign situation calls for it
Course Code: 18CSCSL4080	
Course Title: JAVA PROGRAMMING	
CO-1	Build software development skills using java programming for real worldapplications.
CO-2	Implement basic problems using Java.
CO-3	Make use of multithreading concepts to handle exceptions.
CO-4	Develop programs using java collection API as well as java Standard Library.
CO-5	Develop Graphical User Interface applications using JavaFX.
COURSE OUTCOMES FOR THIRD YEAR FIRST SEMESTER COURSE	
Course Code: 18CMMST5010	
Course Title: MANAGEMENT SCIENCE	
CO-1	Understand the concept and functions of Management, and Theories of Motivation,Styles of Leadership.
CO-2	Apply the Statistical Quality Control Techniques, Methods of inspection, the concept of Inventory Management and Control.
CO-3	Understand the functional areas of organization i.e., Marketing Management, HumanResource Management, and Strategic Management
CO-4	Apply Project Management Techniques
CO-5	Understand the various contemporary issues in Management Practices like TQM andBPO etc..
Course Code: 18CSCST5020	
Course Title: DATABASE MANAGEMENT SYSTEMS	
CO-1	Understand the basic elements of a relational database management system.
CO-2	Draw entity relationship and convert entity relationship diagrams intoRDBMS.
CO-3	Create, maintain, and manipulate a relational database using SQL.

CO-4	Designs and applies normalization techniques for logical schema model.
CO-5	Solves concurrent issues and problems through locking mechanism.
Course Code: 18CSCST5030	
Course Title: OPERATING SYSTEMS	
CO-1	Demonstrate knowledge on Computer System organization and Operatingsystem services
CO-2	Design solutions for process synchronization problems by using System calls and Inter processcommunication.
CO-3	Identify the functionality involved in process management concepts like scheduling andsynchronization.
CO-4	Design models for handling deadlock and perform memory management.
CO-5	Analyze services of I/O subsystems and mechanisms of security & protection.
Course Code: 18CMEGT5040	
Course Title: DATABASE MANAGEMENT SYSTEMS LAB	
CO-1	Understand, appreciate and effectively explain the underlying concepts ofdatabasetechnologies.
CO-2	Design and implement a database schema for a given problem-domain,Normalize adatabase
CO-3	Populate and query a database using SQL DML/DDL commands.
CO-4	Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS
CO-5	Programming PL/SQL including stored procedures, stored functions,cursors,packages
Course Code: 18CSCSL5070	
Course Title: OPERATING SYSTEMS LAB	
CO-1	Analyze different CPU Scheduling algorithms
CO-2	Apply various system calls to handle memory tasks
CO-3	Apply various File Organization Techniques
CO-4	Design models for handling deadlock and perform memorymanagement.
CO-5	Analyze various page replacement techniques
Course Code: 18CMAHS5080	
Course Title: Soft Skills & Aptitude Builder – 1	
CO-1	Re-engineer attitude and understand its influence on behavior
CO-2	Develop interpersonal skills and be an effective goal oriented team player
CO-3	Develop holistic personality with a mature outlook to function effectively in differentcircumstances
CO-4	Solve the real-time problems for performing job functions easily
CO-5	Analyze the problems logically and critically
Course Code: 18CMBIN5090	
Course Title: BIOLOGY FOR ENGINEERS	
CO-1	Describe how biological observations of 18th Century that lead to major discoveries.
CO-2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO-3	Highlight the concepts of recessiveness and dominance during the passage of geneticmaterial from parent to offspring
CO-4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO-5	Classify enzymes and distinguish between different mechanisms of enzyme action, To convey that “Genetics is to biology what Newton’s laws are to Physical Sciences”

Course Code: 18CSCSPX0XI	
Course Title: ARTIFICIAL INTELLIGENCE	
CO-1	Describe about problem spaces and list out various search strategies.
CO-2	Identify and trace the different search algorithms.
CO-3	Summarize different learning methods used in artificial intelligence.
CO-4	Make use of resolution and unification for discovering new facts from existingknowledge base
CO-5	Explain about the significance of expert systems in artificial intelligence.
Course Code: 18CSITO050J	
Course Title: COMPUTER GRAPHICS	
CO-1	Recognize the basic elements and applications of computer graphics.
CO-2	Discuss various algorithms for basic output primitives
CO-3	Use of geometric transformations on graphics objects.
CO-4	Describe 3-D transformations and Visible Surface Detection techniques.
CO-5	Interpret the layout of the animation steps and color models
COURSE OUTCOMES FOR THIRD YEAR SECOND SEMESTER COURSE	
Course Code: 18CSCST6060	
Course Title: AUTOMATA THEORY&COMPILER DESIGN	
CO-1	Ability to classify machines by their power to recognize languages.
CO-2	Design context free grammars for formal languages
CO-3	Ability to describe the different types of parsers. i.e. Top-down, Bottom-up parsers,Construction of SLR,CLR and LALR parse table
CO-4	Ability to explain code optimization techniques
CO-5	Ability to explain code generation techniques to improve the performanceof a program interms of speed &space.
Course Code: 18CSCST6020	
Course Title: COMPUTER NETWORKS	
CO-1	Illustrate the concept of network reference models andclassification of multiplexing.
CO-2	Explain the design issues and various protocols of data link layer.
CO-3	Interpret the use of medium access control sub layer.
CO-4	Analyze various routing algorithms.
CO-5	Experiment with congestion control algorithms and to illustrate the conceptof domain namesystem.
Course Code: 18CSCST6030	
Course Title: SOFTWARE ENGINEERING	
CO-1	Define and develop software applications using different process models.
CO-2	Describe the various design concepts to build real world software.
CO-3	Interpret various coding and testing Techniques
CO-4	Illustrate the Quality measures, Reliability Metrics and CASE Tools
CO-5	Describe need of maintenance and reuse activities

Course Code: 18CSCSP6070	
Course Title: Computer Networks Lab	
CO-1	Understand and explain the basic concepts of Grid Computing.
CO-2	Explain the advantages of using Grid Computing within a given environment
CO-3	Prepare for any upcoming Grid deployments and be able to get started with a
CO-4	Discuss some of the enabling technologies e.g. high-speed links and storage
CO-5	Build computer grids.
Course Code: 18CSCSL6080	
Course Title: COMPILER DESIGN LAB	
CO-1	Demonstrate a working understanding of the process.
CO-2	Understanding of the process of lexical analysis.
CO-3	Understanding of the process of Parsing.
CO-4	Understanding of the process of various design aspects.
CO-5	Construct code for converting BNF rules into YACC.
Course Code: 18CMMST6010	
Course Title: ENGINEERING ECONOMICS & FINANACIAL MANAGEMENT	
CO-1	Summaries the Basic economic tools and concept of Demand
CO-2	Determine the Cost of the Production and BEP
CO-3	Differentiate various the Markets and Pricing methods
CO-4	Analyze Financial Position of the Company
CO-5	Examine various investment project proposals with the help of Capital Budgetingtechniques
Course Code: 18CMAHS6090	
Course Title: Soft Skills & Aptitude Builder - 2	
CO-1	learn and practice effective communication skills
CO-2	develop broad career plans, evaluate the employment market, and become industryready
CO-3	develop accuracy on time and distance and units related solutions
CO-4	solve the real-time problems for performing job functions easily
CO-5	solve problems related to permutations and combinations, probability,areas and volumes
Course Code: 18CSCSP6040	
Course Title: MACHINE LEARNING	
CO-1	Student should be able to understand the classification and its types and problemssolved by ML.
CO-2	Student should be able to illustrate hypothesis space, decision trees and First order rulelearning.
CO-3	Student should be able to apply different classifiers like SVM,KNN and Clusteringtechniques.
CO-4	Student should be able to apply classifiers like Naïve bayes, random forest.
CO-5	Student should be able to compare different dimensionality reduction techniques.
Course Outcomes for Final Year First Semester Course	

Course Code: 18CSCST7010	
Course Title: DATA WAREHOUSING &DATA MINING	
CO-1	Understand stages in building a Data Warehouse
CO-2	Understand the need and importance of pre-processing techniques and Analyze andevaluate performance of algorithms for Association Rules.
CO-3	Understand the need and importance of Similarity and dissimilarity techniques
CO-4	Analyze various Clustering Techniques
CO-5	Apply Various kinds of Mining Techniques on different kinds of data
Course Code: 18CSCSL7070	
Course Title: INTERNET OF THINGS LAB	
CO-1	Choose the sensors and actuators for an IoT application
CO-2	Select protocols for a specific IoT application
CO-3	Utilize the cloud platform and APIs for IoT application
CO-4	Experiment with embedded boards for creating IoT prototypes
CO-5	Design and develop a solution for a given IoT application
Course Code: 18CSCSL7080	
Course Title: DATA WAREHOUSING AND DATA MINING LAB	
CO-1	Apply preprocessing techniques on real world datasets
CO-2	Apply apriori algorithm to generate frequent itemsets.
CO-3	Apply Classification algorithms on different datasets.
CO-4	Apply Clustering algorithms on different datasets.
CO-5	Find dissimilarities in data

Course Code: 18CSCSS7090	
Course Title: MEAN STACK TECHNOLOGIES	
CO-1	Develop professional web pages of an application using HTML elements like lists,navigations, tables, various form elements, embedded media which includes images, audio, video and CSS Styles.
CO-2	Utilize JavaScript for developing interactive HTML web pages and validate form .
CO-3	Build a basic web server using Node.js and also working with Node PackageManager(NPM).
CO-4	Build a web server usingExpress.js
CO-5	Make use of Typescript to optimize JavaScript code by using the concept of strict type checking.
Course Code: 18CSCSP702A	
Course Title: SOFTWARE PROJECT MANAGEMENT	
CO-1	To match organizational needs to the most effective software development model
CO-2	To describe basic concepts and issues of software project management
CO-3	To effectively plan and implement the projects through managing people
CO-4	To effectively plan and implement the projects through communication and change.
CO-5	To select and employ mechanisms for tracking the software projects

SITE 21 Course Outcomes

B.Tech. Computer Science & Engineering

Course Outcomes for First Year First Semester Course	
COURSE CODE : 21CMEGT1010	
COURSE TITLE: TECHNICAL ENGLISH	
CO-1	Ability to understand Scientific vocabulary and use them confidently
CO-2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO-3	Ability to write error free simple technical passages
CO-4	Knowledge of writing different writing styles
CO-5	Confidence to write letters and technical reports clearly and coherently
Course Code: 21CMMAT1020	
Course Title: ENGINEERING MATHEMATICS-I	
CO-1	Solve the differential equations related to various engineering fields (L3)
CO-2	Solve the differential equations of higher order related to various engineering fields(L3)
CO-3	familiarize with functions of several variables which is useful in optimization (L3)
CO-4	Solve the partial partial differential equations of first order (L3)
CO-5	Apply double integration techniques in evaluating areas bounded by region (L3)
Course Code: 21CMEET1030	
Course Title: Basic Electrical Engineering	
CO-1	Understand basic electrical circuit operation.
CO-2	Understand the concept of Alternating Voltage and Current.
CO-3	Understand the operation of DC machines.
CO-4	Understand the working of measuring instruments.
CO-5	Understand the operation of different types of ac machines.
COURSE CODE: 21CMCST1040	
COURSE TITLE: PROGRAMMING FOR PROBLEM SOLVING	
CO-1	Demonstrate computer components, algorithms, translate them into programs.
CO-2	Choose the suitable control structures for the problem to besolved.
CO-3	Make use of arrays, pointers, structures,and unions effectively.
CO-4	Organize reusable code in a program into functions.
CO-5	Demonstration of file operations.
COURSE CODE: 21CMMEL1050	
COURSE TITLE: COMPUTER AIDED ENGINEERING GRAPHICS	
CO-1	understand the BIS conventions of engineering drawing with basic concepts &draw engineering objects with appropriate lettering and dimensioning using various commands of AutoCAD
CO-2	construct polygons, various types of Curves and scales used engineeringapplication like maps, buildings, bridges
CO-3	draw multi views of points, lines and planes by orthographic projection method
CO-4	draw multi views of solids by orthographic projection method
CO-5	convert the orthographic views into isometric views and vice versa by 2D-Commands in AutoCAD

COURSE CODE: 21CMEGL1050	
COURSE TITLE: English & Communication Skills Lab	
CO-1	Listening Comprehension
CO-2	Pronunciation
CO-3	Dialogues
CO-4	Interpersonal Communication Skills
CO-5	Presentations
COURSE CODE: 21CMCSL1080	
COURSE TITLE: PROGRAMMING FOR PROBLEM SOLVING LAB	
CO-1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solvingproblems.
CO-2	Examine and analyze alternative solutions to a problem.
CO-3	Design an algorithmic solution to a problem using problem decomposition and step-wise refinement.
CO-4	Demonstrate conversion of iterative functions to recursive and vice-versa.
CO-5	Implement the concepts of arrays, structures, Unions and files.
COURSE CODE: 21CMEEL1070	
COURSE TITLE: ENVIRONMENTAL SCIENCE	
CO-1	Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion.
CO-2	Preserve several natural resources
CO-3	Summarize the concept of ecosystem
CO-4	Control different types of pollution
CO-5	Understand social issues and environmental legislation
COURSE CODE:21CMMAT2010	
COURSE TITLE: ENGINEERING MATHEMATICS-II	
CO-1	Develop the use of matrix algebra techniques that is needed by engineers forpractical applications and solve system of linear equations (L6)
CO-2	Find the inverse and power of a matrix by Cayley-Hamilton theorem and reduce the Quadratic form (L3)
CO-3	Solve initial value problems by using Laplace transforms (L3)
CO-4	Find the solution of algebraic/ transcendental equations and also interpolate thefunctions(L3)
CO-5	Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (L3).
COURSE OUTCOMES FOR FIRST YEAR SECOND SEMESTER COURSE	
COURSE CODE : 21CSPHT2020	
COURSE TITLE: ENGINEERING PHYSICS	
CO-1	Understand the theoretical view of electrical conductivity in metals using free electron theory and quantum mechanics.
CO-2	Estimate the statistical calculation and the theoretical view of charge carrier's density in semiconductors.
CO-3	Generalization of the light-matter interaction mechanisms.
CO-4	Describe the basic laser physics and working of lasers.
CO-5	Illustrate the construction and working function of LEDs.
CO-6	Analyze the construction and working of photo diodes and solar cells.
COURSE CODE 21CMCHT1030	

COURSE TITLE: ENGINEERING CHEMISTRY	
CO-1	Interpret the mechanism of corrosion
CO-2	Summarize the problems faced in industries due to boiler troubles.
CO-3	Recall the properties and applications of advanced materials.
CO-4	Summarize the advantages of non-conventional energy resources andbatteries.
CO-5	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used for exciting different molecular energy levels.
CO-6	Determine the strength of acid, base and some elements by volumetric and instrumental analysis.
COURSE CODE : 21CMCST2040	
COURSE TITLE : PYTHON PROGRAMMING	
CO-1	Explain the fundamental concepts in the Python language.
CO-2	Implementation of python iterative statements and strings.
CO-3	Demonstrate python lists, dictionaries, and functions.
CO-4	Understand the concepts of modules and packages in python.
CO-5	Complete coding challenges related to object-oriented programming.
CO-6	Apply variety of error handling and GUI programming techniques.
COURSE CODE : 21CSCST2050	
COURSE TITLE : DATA STRUCTURES	
CO-1	Discuss the Basics of data structures and computational efficiency of algorithms for sorting & searching.
CO-2	Illustration of linked lists and its operations.
CO-3	Design programs using a variety of data structures such as stacks and queues.
CO-4	Demonstrate different tree traversing method.
CO-5	Describing the graphs concepts.
COURSE CODE : 21CSPHL2060	
COURSE TITLE : ENGINEERING PHYSICS LAB	
CO-1	Compare the theory and correlated with experiments.
CO-2	Design experiments.
CO-3	Analyze the experimental result.
CO-4	Apply appropriate techniques to perform the experiments.
CO-5	Understand the interaction of the light with semiconductor.
CO-6	Study the characteristic curves of the optoelectronic semiconductor devices.
COURSE CODE : 21CMCHL2070	
COURSE TITLE : ENGINEERING CHEMISTRY LABORATORY	
CO-1	Measure molecular properties like surface tension and viscosity
CO-2	Determine chloride content of water of given water sample
CO-3	Synthesize a drug
CO-4	Determine rate constant as a function of time
CO-5	Determine strength of acids using conductivity meter
CO-6	Determine amount of Fe (II) using potentiometer

COURSE CODE : 21CMEEL2070	
COURSE TITLE : Data Structures Lab	
CO-1	Making use of basic data structures such as arrays and linked list to solveproblems.
CO-2	Demonstrate fundamental algorithmic problems including Tree Traversals, Graph traversals, and shortest paths.
CO-3	Solve various searching and sorting problems.
COURSE CODE : 21CMMSN2080	
COURSE TITLE : CONSTITUTION OF INDIA, PROFESSIONAL ETHICS &HUMAN RIGHTS	
CO-1	Have general knowledge and legal literacy and thereby to take up competitive Examinations.
CO-2	Understand state and central policies, fundamental duties
CO-3	Understand Electoral Process, special provisions
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operativesocieties
CO-5	Understand Engineering ethics and responsibilities of Engineers
CO-6	Understand Engineering Integrity & Reliability
Course Outcomes for Second Year First Semester Course	
Course Code:21CMMAT3010	
Course Title: Probability Distributions & Statistical Methods	
CO-1	Apply least squares method to fit a curve (L5)
CO-2	Analysis the data and evaluate the central tendency of data.
CO-3	Apply the Concepts of Probability and Find the statistical Parameters ofDiscrete and Continuous distributions (L3)
CO-4	Estimate the properties of population from samples (L5)
CO-5	Design the Components of classical Hypothesis test, Conclude the statisticalinferential methods based on small and large samples (L6)
Course Code: 21CSECT3020	
Course Title: ANALOG AND DIGITAL ELECTRONICS	
CO-1	DESCRIBE fundamental gates in digital circuits. Examine the structure of number systems and convert different type of codes and number systems which are used in digital communication and computer systems.
CO-2	DIFFERENCIATE different logic families. Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.
CO-3	ILLUSTRATE the simplification methods of Boolean algebra. Illustrate reduction oflogical expressions using Boolean algebra, k-map and tabulation method and implement the functions using logic gates.
CO-4	DEMONSTARATE the sequential circuits & systems and design different types ofwith and without memory element digital electronic circuits and with operation of A/D and D/A converters.
CO-5	DISCUSS Semiconductor memories and Programmable logic devices. Assess the nomenclature and technology in the area of memory devices and apply the memory devices in different types of digital circuits for real world application. Implement combinational logic circuits using programmable logic devices.
Course Code: 21CSCST3030	
Course Title: Computer Organization	
CO-1	Derstand and apply computer arithmetic on binary numbers
CO-2	Derstand and design basic computer organization
CO-3	Sign & develop instruction set for basic computer
CO-4	Sign & develop control unit for basic computer

CO-5	Emplify in a better way the i/o and memory organization.
Course Code: 21CSCST3040	
Course Title: JAVA PROGRAMMING	
CO-1	Able to realize the concept of Object-Oriented Programming & Java Programming Constructs
CO-2	Able to describe the basic concepts of Java such as operators, classes, objects, inheritance, packages, Enumeration, and various keywords
CO-3	Apply the concept of exception handling and Input/ Output operations
CO-4	Able to design the applications of Java & Java applet
CO-5	Able to Analyze & Design the concept of Event Handling and Swing
Course Code: 21CSCST3050	
Course Title: DATABASE MANAGEMENT SYSTEMS	
CO-1	Recognize the basic elements of a relational database management system.
CO-2	Draw entity relationship and convert entity relationship diagrams into RDBMS.
CO-3	Create, maintain, and manipulate a relational database using SQL.
CO-4	Designs and applies normalization techniques for logical schema model.
CO-5	Solves concurrent issues and problems through locking mechanism.
Course Code: 21CSECL3060	
Course Title: ANALOG AND DIGITAL ELECTRONICS LAB	
CO-1	Understand the characteristics of PN Diode and Zener diode
CO-2	Analyze the characteristics of BJT
CO-3	Analyze the characteristics of MOSFET
CO-4	Construct and demonstrate the functionality of Combinational circuits
CO-5	Construct and demonstrate the functionality of Sequential circuits
Course Code: 21CSCSL3070	
Course Title: JAVA PROGRAMMING LAB	
CO-1	Evaluate default value of all primitive data type, Operations, Expressions,Control flow, Strings.
CO-2	Determine Class, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism.
CO-3	Illustrating simple inheritance, multi-level inheritance, Exception handlingmechanism.
CO-4	Construct Threads, Event Handling, implement packages
CO-5	Construct applications using applets.
Course Code: 21CSCSL3080	
Course Title: DATABASE MANAGEMENT SYSTEMS LAB	
CO-1	Explore the concepts of SQL built in functions.
CO-2	Design and implement a database schema for a given problem-domain,Normalize a database
CO-3	Populate and query a database using SQL DML/DDL commands.
CO-4	Declare and enforce integrity constraints on a database using a state-of-the-artRDBMS

CO-5	Practice PL/SQL including stored procedures, stored functions, cursors,packages.
Course Code: 21CSCSS3090	
Course Title: Data Science using Python	
CO-1	Perform various operations on numpy arrays.
CO-2	Importing data from different file formats using pandas.
CO-3	Apply various techniques to extract data from websources.
CO-4	Explore various preprocessing techniques to handle Data Sets.
CO-5	Draw different types of charts using matplotlib

Course Code: 21CSMSN3100	
Course Title: BIOLOGY FOR ENGINEERS	
CO-1	Describe how biological observations of 18th Century that lead to major discoveries.
CO-2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological.
CO-3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO-4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO-5	Classify enzymes and distinguish between different mechanisms of enzymeaction, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"
Course Outcomes for Second Year Second Semester Course	
Course Code: 21CMMAT4010	
Course Title: DISCRETE MATHEMATICS	
CO-1	Analyze natural language arguments by means of symbolic propositional logic.
CO-2	Identify and manipulate basic mathematical objects such as sets, functions, andrelations.
CO-3	Use of basic theorems in number theory to solve exponential problems andDemonstrating basic algebraic structures and combinatorics.
CO-4	Solve recurrence relations by using different methods.
CO-5	Apply graph theory concepts to solve real-time problems.
Course Code: 21CSMST4020	
Course Title: ENGINEERING ECONOMICS AND FINANCIAL MANAGEMENT	
CO-1	Express knowledge of managerial economics and estimatingdemand for aproduct.
CO-2	Recognize Production and Cost concepts, estimating Cost Break evenAnalysis.
CO-3	Express knowledge on Markets and Pricing methods along withBusinessCycles.
CO-4	Apply Accounting Concepts and Prepare Financial Statements- andAnalysis
CO-5	Analyze various investment project proposals with the help ofCapitalBudgeting techniques.
Course Code: 21CSCST4030	
Course Title: OPERATING SYSTEMS	
CO-1	Demonstrate knowledge on Computer System organization and Operating system services.
CO-2	Design solutions for process synchronization problems by using System callsand Inter process communication.

CO-3	Identify the functionality involved in process management concepts likescheduling and synchronization.
CO-4	Design models for handling deadlock and perform memory management.
CO-5	Analyze services of I/O subsystems and mechanisms of security & protection.
Course Code: 21CSCST4040	
Course Title: DESIGN AND ANALYSIS OF ALGORITHMS	
CO-1	Demonstrate asymptotic notation and divide and conquer technique.
CO-2	Use greedy technique to solve various problems.
CO-3	Demonstrate dynamic programming technique to various problems.
CO-4	Develop algorithms using backtracking technique.
CO-5	Demonstrate branch and bound technique to various problems.
Course Code: 21CSCST4050	
Course Title: SOFTWARE ENGINEERING	
CO-1	Define and develop a software project from requirement gathering toimplementation.
CO-2	Obtain knowledge about principles and practices of software engineering
CO-3	Focus on the fundamentals of software project
CO-4	Focus on modelling a software project
CO-5	Obtain knowledge about estimation and maintenance of software systems
Course Code: 21CSCSL4060	
Course Title: OPERATING SYSTEMS LAB	
CO-1	Implement CPU scheduling algorithms.
CO-2	Describe deadlock avoidance and prevention algorithms.
CO-3	Interpret page replacement and memory management algorithms.
CO-4	Apply the process management concepts & Techniques.
CO-5	Describe the storage management concepts.
Course Code: 21CSCSL4070	
Course Title: DESIGN AND ANALYSIS OF ALGORITHMS LAB	
CO-1	For a given algorithms analyze worst-case running times of algorithms based onasymptotic analysis and justify the correctness of algorithms.
CO-2	Describe the greedy paradigm and explain when an algorithmic design situationcalls for it. For a given problem develop the greedy algorithms.
CO-3	Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Synthesize divide-and-conquer algorithms. Deriveand solve recurrence relation.
CO-4	Describe the dynamic-programming paradigm and explain when an algorithmicdesign situation calls for it.
CO-5	For a given problem of dynamic-programming an develop the dynamic programming algorithms and analyze it to determine its computational complexity.
Course Code: 21CSCSL4080	
Course Title: SOFTWARE ENGINEERING LAB	
CO-1	Attain knowledge on preparing SRS document

CO-2	Estimate the cost of the project.
CO-3	Design ER and DFD Diagrams
CO-4	Design the test cases for the user specification.
CO-5	Implement various versions of software for customization.
Course Code: 21CSCSL4090	
Course Title: MEAN STACK TECHNOLOGIES	
CO-1	Develop professional web pages of an application using HTML elements like lists, navigations, tables, various form elements, embedded media whichincludes images, audio, video and CSS Styles.
CO-2	Utilize JavaScript for developing interactive HTML web pages and validateform .
CO-3	Build a basic web server using Node.js and also working with Node PackageManager(NPM).
CO-4	Build a web server usingExpress.js
CO-5	Make use of Typescript to optimize JavaScript code by using the concept of strict type checking.

SITE 18M Course Outcomes

B. Tech- Computer Science & Technology

Course Outcomes for First Year First Semester Course	
Course Code: 18CMMAT1010	
Course Title: ENGINEERING MATHEMATICS-I	
CO-1	Solve the differential equations related to various engineering fields (L3)
CO-2	Solve the differential equations of higher order related to various engineering fields (L3)
CO-3	familiarize with functions of several variables which is useful in optimization (L3)
CO-4	Solve the partial partial differential equations of first order (L3)
CO-5	Apply double integration techniques in evaluating areas bounded by region (L3)
COURSE CODE : 18CTPHT1020	
COURSE TITLE: ENGINEERING PHYSICS	
CO-1	Understand the theoretical view of electrical conductivity in metals using free electron theory and quantum mechanics.
CO-2	Estimate the statistical calculation and the theoretical view of charge carrier's density in semiconductors.
CO-3	Generalization of the light-matter interaction mechanisms.
CO-4	Describe the basic laser physics and working of lasers.
CO-5	Illustrate the construction and working function of LEDs.
CO-6	Analyze the construction and working of photo diodes and solar cells.
COURSE CODE 18CMCHT1030	
COURSE TITLE: ENGINEERING CHEMISTRY	
CO-1	Interpret the mechanism of corrosion
CO-2	Summarize the problems faced in industries due to boiler troubles.
CO-3	Recall the properties and applications of advanced materials.
CO-4	Summarize the advantages of non-conventional energy resources and batteries.
CO-5	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used for exciting different molecular energy levels.
CO-6	Determine the strength of acid, base and some elements by volumetric and instrumental analysis.
COURSE CODE: 18CMCTT1040	
COURSE TITLE: PROGRAMMING FOR PROBLEM SOLVING	
CO-1	Demonstrate computer components, algorithms, translate them into programs.
CO-2	Choose the suitable control structures for the problem to besolved.
CO-3	Make use of arrays, pointers, structures,and unions effectively.
CO-4	Organize reusable code in a program into functions.
CO-5	Demonstration of file operations.
COURSE CODE: 18CTMEL1050	
COURSE TITLE: COMPUTER AIDED ENGINEERING GRAPHICS	
CO-1	understand the BIS conventions of engineering drawing with basic concepts &draw engineering objects with appropriate lettering and dimensioning using various commands of AutoCAD
CO-2	construct polygons, various types of Curves and scales used engineeringapplication like maps, buildings, bridges

CO-3	draw multi views of points, lines and planes by orthographic projection method
CO-4	draw multi views of solids by orthographic projection method
CO-5	convert the orthographic views into isometric views and vice versa by 2D-Commands in AutoCAD
COURSE CODE : 18CTPHL1060	
COURSE TITLE : ENGINEERING PHYSICS LAB	
CO-1	Compare the theory and correlated with experiments.
CO-2	Design experiments.
CO-3	Analyze the experimental result.
CO-4	Apply appropriate techniques to perform the experiments.
CO-5	Understand the interaction of the light with semiconductor.
CO-6	Study the characteristic curves of the optoelectronic semiconductor devices.
COURSE CODE : 18CMCHL1070	
COURSE TITLE : ENGINEERING CHEMISTRY LABORATORY	
CO-1	Measure molecular properties like surface tension and viscosity
CO-2	Determine chloride content of water of given water sample
CO-3	Synthesize a drug
CO-4	Determine rate constant as a function of time
CO-5	Determine strength of acids using conductivity meter
CO-6	Determine amount of Fe (II) using potentiometer
COURSE CODE: 18CMCTL1080	
COURSE TITLE: PROGRAMMING FOR PROBLEM SOLVING LAB	
CO-1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solving problems.
CO-2	Examine and analyze alternative solutions to a problem.
CO-3	Design an algorithmic solution to a problem using problem decomposition and step-wise refinement.
CO-4	Demonstrate conversion of iterative functions to recursive and vice-versa.
CO-5	Implement the concepts of arrays, structures, Unions and files.
COURSE CODE : 18CMESN1090	
COURSE TITLE : CONSTITUTION OF INDIA, PROFESSIONAL ETHICS &HUMAN RIGHTS	
CO-1	Have general knowledge and legal literacy and thereby to take up competitiveExaminations.
CO-2	Understand state and central policies, fundamental duties
CO-3	Understand Electoral Process, special provisions
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operativesocieties
CO-5	Understand Engineering ethics and responsibilities of Engineers
CO-6	Understand Engineering Integrity & Reliability
COURSE OUTCOMES FOR FIRST YEAR SECOND SEMESTER COURSE	
COURSE CODE : 18CMEGT2010	
COURSE TITLE: TECHNICAL ENGLISH	
CO-1	Ability to understand Scientific vocabulary and use them confidently
CO-2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO-3	Ability to write error free simple technical passages

CO-4	Knowledge of writing different writing styles
CO-5	Confidence to write letters and technical reports clearly and coherently
COURSE CODE:18CMMAT2020	
COURSE TITLE: ENGINEERING MATHEMATICS-II	
CO-1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications and solve system of linear equations (L6)
CO-2	Find the inverse and power of a matrix by Cayley-Hamilton theorem and reduce the Quadratic form (L3)
CO-3	Solve initial value problems by using Laplace transforms (L3)
CO-4	Find the solution of algebraic/ transcendental equations and also interpolate thefunctions(L3)
CO-5	Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (L3).
Course Code: 18CMEET2030	
Course Title: Basic Electrical Engineering	
CO-1	Understand basic electrical circuit operation.
CO-2	Understand the concept of Alternating Voltage and Current.
CO-3	Understand the operation of DC machines.
CO-4	Understand the working of measuring instruments.
CO-5	Understand the operation of different types of ac machines.
COURSE CODE : 18CMCTT2040	
COURSE TITLE : PYTHON PROGRAMMING	
CO-1	Explain the fundamental concepts in the Python language.
CO-2	Implementation of python iterative statements and strings.
CO-3	Demonstrate python lists, dictionaries, and functions.
CO-4	Understand the concepts of modules and packages in python.
CO-5	Complete coding challenges related to object-oriented programming.
CO-6	Apply variety of error handling and GUI programming techniques.
COURSE CODE : 18CTCTT2050	
COURSE TITLE : DATA STRUCTURES	
CO-1	Discuss the Basics of data structures and computational efficiency of algorithms forsorting & searching.
CO-2	Illustration of linked lists and its operations.
CO-3	Design programs using a variety of data structures such as stacks and queues.
CO-4	Demonstrate different tree traversing method.
CO-5	Describing the graphs concepts.
COURSE CODE: 18CMEGL2060	
COURSE TITLE: English Communication Skills Lab	
CO-1	Listening Comprehension
CO-2	Pronunciation
CO-3	Dialogues
CO-4	Interpersonal Communication Skills
CO-5	Presentations

Course Code: 18CMEEL2070	
Course Title: Basic Electrical Engineering Lab	
CO-1	Understand basic electrical circuit operation.
CO-2	Understand the concept of Alternating Voltage and Current.
CO-3	Understand the operation of DC machines.
CO-4	Understand the working of measuring instruments.
CO-5	Understand the operation of different types of ac machines.
COURSE CODE : 18CTCTL2080	
COURSE TITLE : Data Structures Lab	
CO-1	Making use of basic data structures such as arrays and linked list to solveproblems.
CO-2	Demonstrate fundamental algorithmic problems including Tree Traversals, Graph traversals, and shortest paths.
CO-3	Solve various searching and sorting problems.
COURSE CODE: 18CMMSN2090	
COURSE TITLE: ENVIRONMENTAL SCIENCE	
CO-1	Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion.
CO-2	Preserve several natural resources
CO-3	Summarize the concept of ecosystem
CO-4	Control different types of pollution
CO-5	Understand social issues and environmental legislation
Course Outcomes for Second Year First Semester Course	
Course Code:18CMMAT3010	
Course Title: Probability Distributions & Statistical Methods	
CO-1	Apply least squares method to fit a curve (L5)
CO-2	Analysis the data and evaluate the central tendency of data.
CO-3	Apply the Concepts of Probability and Find the statistical Parameters of Discreteand Continuous distributions (L3)
CO-4	Estimate the properties of population from samples (L5)
CO-5	Design the Components of classical Hypothesis test, Conclude the statisticalinferential methods based on small and large samples (L6)
Course Code: 18CTECT3020	
Course Title: ANALOG AND DIGITAL ELECTRONICS	
CO-1	Understand the characteristics and utilization of various components.
CO-2	Understand and analyze the BJT and MOSFET
CO-3	Apply the Boolean algebra to optimize the logic functions using K-maps andUnderstand the field effect transistors.
CO-4	To design and analyze combinational logic circuits.
CO-5	To design and analyze sequential logic circuits.
Course Code: 18CTCTT3030	
Course Title: Computer Organization	
CO-1	Understand and apply computer arithmetic on binary numbers

CO-2	Understand and design basic computer organization
CO-3	Design & Develop instruction set for basic computer
CO-4	Design & Develop control unit for basic computer
Course Code: 18CTCTL3070	
Course Title: JAVA PROGRAMMING LAB	
CO-1	Evaluate default value of all primitive data type, Operations, Expressions, Control flow, Strings.
CO-2	Determine Class, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism.
CO-3	Illustrating simple inheritance, multi-level inheritance, Exception handlingmechanism.
CO-4	Construct Threads, Event Handling, implement packages
CO-5	Construct applications using applets.
Course Code: 18CTCTL3080	
Course Title: DATABASE MANAGEMENT SYSTEMS LAB	
CO-1	Explore the concepts of SQL built in functions.
CO-2	Design and implement a database schema for a given problem-domain,Normalize a database
CO-3	Populate and query a database using SQL DML/DDL commands.
CO-4	Declare and enforce integrity constraints on a database using a state-of-the-artRDBMS
CO-5	Practice PL/SQL including stored procedures, stored functions, cursors,packages.
Course Code: 18CTCTS3090	
Course Title: Data Science using Python	
CO-1	Perform various operations on numpy arrays.
CO-2	Importing data from different file formats using pandas.
CO-3	Apply various techniques to extract data from websources.
CO-4	Explore various preprocessing techniques to handle Data Sets.
CO-5	Draw different types of charts using matplotlib
Course Code: 18CTMSN3100	
Course Title: BIOLOGY FOR ENGINEERS	
CO-1	Describe how biological observations of 18th Century that lead to major discoveries.
CO-2	Convey that classification is not what biology is all about but highlight theunderlying criteria, such as morphological, biochemical and ecological.
CO-3	Highlight the concepts of recessiveness and dominance during the passage ofgenetic material from parent to offspring
CO-4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
CO-5	Classify enzymes and distinguish between different mechanisms of enzymeaction, To convey that “Genetics is to biology what Newton’s laws are to Physical Sciences”
Course Outcomes for Second Year Second Semester Course	
Course Code: 18CMMAT4010	
Course Title: DISCRETE MATHEMATICS	

CO-1	Analyze natural language arguments by means of symbolic propositional logic.
CO-2	Identify and manipulate basic mathematical objects such as sets, functions, andrelations.
CO-3	Use of basic theorems in number theory to solve exponential problems andDemonstrating basic algebraic structures and combinatorics.
CO-4	Solve recurrence relations by using different methods.
CO-5	Apply graph theory concepts to solve real-time problems.
Course Code: 18CTMST4020	
Course Title: ENGINEERING ECONOMICS AND FINANCIAL MANAGEMENT	
CO-1	Express knowledge of managerial economics and estimatingdemand for aproduct.
CO-2	Recognize Production and Cost concepts, estimating Cost Break evenAnalysis.
CO-3	Express knowledge on Markets and Pricing methods along withBusinessCycles.
CO-4	Apply Accounting Concepts and Prepare Financial Statements- andAnalysis
CO-5	Analyze various investment project proposals with the help ofCapitalBudgeting techniques.
Course Code: 18CTCTT4030	
Course Title: OPERATING SYSTEMS	
CO-1	Demonstrate knowledge on Computer System organization and Operating system services.
CO-2	Design solutions for process synchronization problems by using System callsand Inter process communication.
CO-3	Identify the functionality involved in process management concepts like scheduling and synchronization.
CO-4	Design models for handling deadlock and perform memory management.
CO-5	Analyze services of I/O subsystems and mechanisms of security & protection.
Course Code: 18CTCTT4040	
Course Title: DESIGN AND ANALYSIS OF ALGORITHMS	
CO-1	Demonstrate asymptotic notation and divide and conquer technique.
CO-2	Use greedy technique to solve various problems.
CO-3	Demonstrate dynamic programming technique to various problems.
CO-4	Develop algorithms using backtracking technique.
CO-5	Demonstrate branch and bound technique to various problems.
Course Code: 18CTCTT4050	
Course Title: SOFTWARE ENGINEERING	
CO-1	Define and develop a software project from requirement gathering to implementation.
CO-2	Obtain knowledge about principles and practices of software engineering
CO-3	Focus on the fundamentals of software project
CO-4	Focus on modelling a software project
CO-5	Obtain knowledge about estimation and maintenance of software systems
Course Code: 18CTCTL4060	
Course Title: OPERATING SYSTEMS LAB	
CO-1	Implement CPU scheduling algorithms.

CO-2	Describe deadlock avoidance and prevention algorithms.
CO-3	Interpret page replacement and memory management algorithms.
CO-4	Apply the process management concepts & Techniques.
CO-5	Describe the storage management concepts.
Course Code: 18CTCTL4070	
Course Title: DESIGN AND ANALYSIS OF ALGORITHMS LAB	
CO-1	For a given algorithms analyze worst-case running times of algorithms based on asymptoticanalysis and justify the correctness of algorithms.
CO-2	Describe the greedy paradigm and explain when an algorithmic design situation calls for it. For agiven problem develop the greedy algorithms.
CO-3	Describe the divide-and-conquer paradigm and explain when an algorithmic design situationcalls for it. Synthesize divide-and-conquer algorithms. Derive and solve recurrence relation.
CO-4	Describe the dynamic-programming paradigm and explain when an algorithmic design situationcalls for it.
CO-5	For a given problem of dynamic-programming an develop the dynamic programming algorithms and analyze it to determine its computational complexity.
Course Code: 18CTCTL4080	
Course Title: SOFTWARE ENGINEERING LAB	
CO-1	Attain knowledge on preparing SRS document
CO-2	Estimate the cost of the project.
CO-3	Design ER and DFD Diagrams
CO-4	Design the test cases for the user specification.
CO-5	Implement various versions of software for customization.
Course Code: 18CTCTS4090	
Course Title: MEAN STACK TECHNOLOGIES	
CO-1	Develop professional web pages of an application using HTML elements like lists, navigations,tables, various form elements, embedded media which includes images, audio, video and CSS Styles.
CO-2	Utilize JavaScript for developing interactive HTML web pages and validate form .
CO-3	Build a basic web server using Node.js and also working with Node Package Manager(NPM).
CO-4	Build a web server usingExpress.js
CO-5	Make use of Typescript to optimize JavaScript code by using the concept of strict type checking.

SITE 21 Course Outcomes

B. Tech- Computer Science & Technology

Course Outcomes for First Year First Semester Course	
Course Code: 21CMMAT1010	
Course Title: ENGINEERING MATHEMATICS-I	
CO-1	Solve the differential equations related to various engineering fields (L3)
CO-2	Solve the differential equations of higher order related to various engineering fields (L3)
CO-3	familiarize with functions of several variables which is useful in optimization (L3)
CO-4	Solve the partial partial differential equations of first order (L3)
CO-5	Apply double integration techniques in evaluating areas bounded by region (L3)
COURSE CODE : 21CTPHT1020	
COURSE TITLE: ENGINEERING PHYSICS	
CO-1	Understand the theoretical view of electrical conductivity in metals using free electron theory and quantum mechanics.
CO-2	Estimate the statistical calculation and the theoretical view of charge carrier's density in semiconductors.
CO-3	Generalization of the light-matter interaction mechanisms.
CO-4	Describe the basic laser physics and working of lasers.
CO-5	Illustrate the construction and working function of LEDs.
CO-6	Analyze the construction and working of photo diodes and solar cells.
COURSE CODE 21CMCHT1030	
COURSE TITLE: ENGINEERING CHEMISTRY	
CO-1	Interpret the mechanism of corrosion
CO-2	Summarize the problems faced in industries due to boiler troubles.
CO-3	Recall the properties and applications of advanced materials.
CO-4	Summarize the advantages of non-conventional energy resources and batteries.
CO-5	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used for exciting different molecular energy levels.
CO-6	Determine the strength of acid, base and some elements by volumetric and instrumental analysis.
COURSE CODE: 21CMCTT1040	
COURSE TITLE: PROGRAMMING FOR PROBLEM SOLVING	
CO-1	Demonstrate computer components, algorithms, translate them into programs.
CO-2	Choose the suitable control structures for the problem to besolved.
CO-3	Make use of arrays, pointers, structures,and unions effectively.
CO-4	Organize reusable code in a program into functions.
CO-5	Demonstration of file operations.
COURSE CODE: 21CTMEL1050	
COURSE TITLE: COMPUTER AIDED ENGINEERING GRAPHICS	
CO-1	understand the BIS conventions of engineering drawing with basic concepts &draw engineering objects with appropriate lettering and dimensioning using various commands of AutoCAD
CO-2	construct polygons, various types of Curves and scales used engineeringapplication like maps, buildings, bridges

CO-3	draw multi views of points, lines and planes by orthographic projection method
CO-4	draw multi views of solids by orthographic projection method
CO-5	convert the orthographic views into isometric views and vice versa by 2D-Commands in AutoCAD
COURSE CODE : 21CTPHL1060	
COURSE TITLE : ENGINEERING PHYSICS LAB	
CO-1	Compare the theory and correlated with experiments.
CO-2	Design experiments.
CO-3	Analyze the experimental result.
CO-4	Apply appropriate techniques to perform the experiments.
CO-5	Understand the interaction of the light with semiconductor.
CO-6	Study the characteristic curves of the optoelectronic semiconductor devices.
COURSE CODE : 21CMCHL1070	
COURSE TITLE : ENGINEERING CHEMISTRY LABORATORY	
CO-1	Measure molecular properties like surface tension and viscosity
CO-2	Determine chloride content of water of given water sample
CO-3	Synthesize a drug
CO-4	Determine rate constant as a function of time
CO-5	Determine strength of acids using conductivity meter
CO-6	Determine amount of Fe (II) using potentiometer
COURSE CODE: 21CMCTL1080	
COURSE TITLE: PROGRAMMING FOR PROBLEM SOLVING LAB	
CO-1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solving problems.
CO-2	Examine and analyze alternative solutions to a problem.
CO-3	Design an algorithmic solution to a problem using problem decomposition and step-wise refinement.
CO-4	Demonstrate conversion of iterative functions to recursive and vice-versa.
CO-5	Implement the concepts of arrays, structures, Unions and files.
COURSE CODE : 21CMESN1090	
COURSE TITLE : CONSTITUTION OF INDIA, PROFESSIONAL ETHICS &HUMAN RIGHTS	
CO-1	Have general knowledge and legal literacy and thereby to take up competitiveExaminations.
CO-2	Understand state and central policies, fundamental duties
CO-3	Understand Electoral Process, special provisions
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operativesocieties
CO-5	Understand Engineering ethics and responsibilities of Engineers
CO-6	Understand Engineering Integrity & Reliability
COURSE OUTCOMES FOR FIRST YEAR SECOND SEMESTER COURSE	
COURSE CODE : 21CMEGT2010	
COURSE TITLE: TECHNICAL ENGLISH	
CO-1	Ability to understand Scientific vocabulary and use them confidently
CO-2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO-3	Ability to write error free simple technical passages

CO-4	Knowledge of writing different writing styles
CO-5	Confidence to write letters and technical reports clearly and coherently
COURSE CODE:21CMMAT2020	
COURSE TITLE: ENGINEERING MATHEMATICS-II	
CO-1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications and solve system of linear equations (L6)
CO-2	Find the inverse and power of a matrix by Cayley-Hamilton theorem and reduce the Quadratic form (L3)
CO-3	Solve initial value problems by using Laplace transforms (L3)
CO-4	Find the solution of algebraic/ transcendental equations and also interpolate thefunctions(L3)
CO-5	Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (L3).
Course Code: 21CMEET2030	
Course Title: Basic Electrical Engineering	
CO-1	Understand basic electrical circuit operation.
CO-2	Understand the concept of Alternating Voltage and Current.
CO-3	Understand the operation of DC machines.
CO-4	Understand the working of measuring instruments.
CO-5	Understand the operation of different types of ac machines.
COURSE CODE : 21CMCTT2040	
COURSE TITLE : PYTHON PROGRAMMING	
CO-1	Explain the fundamental concepts in the Python language.
CO-2	Implementation of python iterative statements and strings.
CO-3	Demonstrate python lists, dictionaries, and functions.
CO-4	Understand the concepts of modules and packages in python.
CO-5	Complete coding challenges related to object-oriented programming.
CO-6	Apply variety of error handling and GUI programming techniques.
COURSE CODE : 21CTCTT2050	
COURSE TITLE : DATA STRUCTURES	
CO-1	Discuss the Basics of data structures and computational efficiency of algorithms forsorting & searching.
CO-2	Illustration of linked lists and its operations.
CO-3	Design programs using a variety of data structures such as stacks and queues.
CO-4	Demonstrate different tree traversing method.
CO-5	Describing the graphs concepts.
COURSE CODE: 21CMEGL2060	
COURSE TITLE: English Communication Skills Lab	
CO-1	Listening Comprehension
CO-2	Pronunciation
CO-3	Dialogues
CO-4	Interpersonal Communication Skills
CO-5	Presentations

Course Code: 21CMEEL2070	
Course Title: Basic Electrical Engineering Lab	
CO-1	Understand basic electrical circuit operation.
CO-2	Understand the concept of Alternating Voltage and Current.
CO-3	Understand the operation of DC machines.
CO-4	Understand the working of measuring instruments.
CO-5	Understand the operation of different types of ac machines.
COURSE CODE : 21CTCTL2080	
COURSE TITLE : Data Structures Lab	
CO-1	Making use of basic data structures such as arrays and linked list to solveproblems.
CO-2	Demonstrate fundamental algorithmic problems including Tree Traversals, Graph traversals, and shortest paths.
CO-3	Solve various searching and sorting problems.
COURSE CODE: 21CMMSN2090	
COURSE TITLE: ENVIRONMENTAL SCIENCE	
CO-1	Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion.
CO-2	Preserve several natural resources
CO-3	Summarize the concept of ecosystem
CO-4	Control different types of pollution
CO-5	Understand social issues and environmental legislation

Course Outcomes for Second Year First Semester Course	
Course Code:21CMMAT3010	
Course Title: Probability Distributions & Statistical Methods	
CO-1	Apply least squares method to fit a curve (L5)
CO-2	Analysis the data and evaluate the central tendency of data.
CO-3	Apply the Concepts of Probability and Find the statistical Parameters of Discreteand Continuous distributions (L3)
CO-4	Estimate the properties of population from samples (L5)
CO-5	Design the Components of classical Hypothesis test, Conclude the statisticalinferential methods based on small and large samples (L6)
Course Code: 21CTECT3020	
Course Title: ANALOG AND DIGITAL ELECTRONICS	
CO-1	Understand the characteristics and utilization of various components.
CO-2	Understand and analyze the BJT and MOSFET
CO-3	Apply the Boolean algebra to optimize the logic functions using K-maps andUnderstand the field effect transistors.

CO-4	To design and analyze combinational logic circuits.
CO-5	To design and analyze sequential logic circuits.
Course Code: 21CTCTT3030	
Course Title: Computer Organization	
CO-1	Understand and apply computer arithmetic on binary numbers
CO-2	Understand and design basic computer organization
CO-3	Design & Develop instruction set for basic computer
CO-4	Design & Develop control unit for basic computer
Course Code: 21CTCTL3070	
Course Title: JAVA PROGRAMMING LAB	
CO-1	Evaluate default value of all primitive data type, Operations, Expressions, Control flow, Strings.
CO-2	Determine Class, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism.
CO-3	Illustrating simple inheritance, multi-level inheritance, Exception handlingmechanism.
CO-4	Construct Threads, Event Handling, implement packages
CO-5	Construct applications using applets.
Course Code: 21CTCTL3080	
Course Title: DATABASE MANAGEMENT SYSTEMS LAB	
CO-1	Explore the concepts of SQL built in functions.
CO-2	Design and implement a database schema for a given problem-domain,Normalize a database
CO-3	Populate and query a database using SQL DML/DDL commands.
CO-4	Declare and enforce integrity constraints on a database using a state-of-the-artRDBMS
CO-5	Practice PL/SQL including stored procedures, stored functions, cursors,packages.
Course Code: 21CTCTS3090	
Course Title: Data Science using Python	
CO-1	Perform various operations on numpy arrays.
CO-2	Importing data from different file formats using pandas.
CO-3	Apply various techniques to extract data from websources.
CO-4	Explore various preprocessing techniques to handle Data Sets.
CO-5	Draw different types of charts using matplotlib
Course Code: 21CTMSN3100	
Course Title: BIOLOGY FOR ENGINEERS	
CO-1	Describe how biological observations of 18th Century that lead to major discoveries.
CO-2	Convey that classification is not what biology is all about but highlight theunderlying criteria, such as morphological, biochemical and ecological.
CO-3	Highlight the concepts of recessiveness and dominance during the passage ofgenetic material from parent to offspring
CO-4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine

CO-5	Classify enzymes and distinguish between different mechanisms of enzymeaction, To convey that "Genetics is to biology what Newton's laws are to Physical Sciences"
Course Outcomes for Second Year Second Semester Course	
Course Code: 21CMMAT4010	
Course Title: DISCRETE MATHEMATICS	
CO-1	Analyze natural language arguments by means of symbolic propositional logic.
CO-2	Identify and manipulate basic mathematical objects such as sets, functions, andrelations.
CO-3	Use of basic theorems in number theory to solve exponential problems andDemonstrating basic algebraic structures and combinatorics.
CO-4	Solve recurrence relations by using different methods.
CO-5	Apply graph theory concepts to solve real-time problems.
Course Code: 21CTMST4020	
Course Title: ENGINEERING ECONOMICS AND FINANCIAL MANAGEMENT	
CO-1	Express knowledge of managerial economics and estimatingdemand for aproduct.
CO-2	Recognize Production and Cost concepts, estimating Cost Break evenAnalysis.
CO-3	Express knowledge on Markets and Pricing methods along withBusinessCycles.
CO-4	Apply Accounting Concepts and Prepare Financial Statements- andAnalysis
CO-5	Analyze various investment project proposals with the help ofCapitalBudgeting techniques.
Course Code: 21CTCTT4030	
Course Title: OPERATING SYSTEMS	
CO-1	Demonstrate knowledge on Computer System organization and Operating system services.
CO-2	Design solutions for process synchronization problems by using System callsand Inter process communication.
CO-3	Identify the functionality involved in process management concepts like scheduling and synchronization.
CO-4	Design models for handling deadlock and perform memory management.
CO-5	Analyze services of I/O subsystems and mechanisms of security & protection.
Course Code: 21CTCTT4040	
Course Title: DESIGN AND ANALYSIS OF ALGORITHMS	
CO-1	Demonstrate asymptotic notation and divide and conquer technique.
CO-2	Use greedy technique to solve various problems.
CO-3	Demonstrate dynamic programming technique to various problems.
CO-4	Develop algorithms using backtracking technique.
CO-5	Demonstrate branch and bound technique to various problems.
Course Code: 21CTCTT4050	
Course Title: SOFTWARE ENGINEERING	
CO-1	Define and develop a software project from requirement gathering to implementation.
CO-2	Obtain knowledge about principles and practices of software engineering
CO-3	Focus on the fundamentals of software project

CO-4	Focus on modelling a software project
CO-5	Obtain knowledge about estimation and maintenance of software systems
Course Code: 21CTCTL4060	
Course Title: OPERATING SYSTEMS LAB	
CO-1	Implement CPU scheduling algorithms.
CO-2	Describe deadlock avoidance and prevention algorithms.
CO-3	Interpret page replacement and memory management algorithms.
CO-4	Apply the process management concepts & Techniques.
CO-5	Describe the storage management concepts.
Course Code: 21CTCTL4070	
Course Title: DESIGN AND ANALYSIS OF ALGORITHMS LAB	
CO-1	For a given algorithms analyze worst-case running times of algorithms based on asymptoticanalysis and justify the correctness of algorithms.
CO-2	Describe the greedy paradigm and explain when an algorithmic design situation calls for it. For agiven problem develop the greedy algorithms.
CO-3	Describe the divide-and-conquer paradigm and explain when an algorithmic design situationcalls for it. Synthesize divide-and-conquer algorithms. Derive and solve recurrence relation.
CO-4	Describe the dynamic-programming paradigm and explain when an algorithmic design situationcalls for it.
CO-5	For a given problem of dynamic-programming an develop the dynamic programming algorithms and analyze it to determine its computational complexity.
Course Code: 21CTCTL4080	
Course Title: SOFTWARE ENGINEERING LAB	
CO-1	Attain knowledge on preparing SRS document
CO-2	Estimate the cost of the project.
CO-3	Design ER and DFD Diagrams
CO-4	Design the test cases for the user specification.
CO-5	Implement various versions of software for customization.
Course Code: 21CTCTS4090	
Course Title: MEAN STACK TECHNOLOGIES	
CO-1	Develop professional web pages of an application using HTML elements like lists, navigations,tables, various form elements, embedded media which includes images, audio, video and CSS Styles.
CO-2	Utilize JavaScript for developing interactive HTML web pages and validate form .
CO-3	Build a basic web server using Node.js and also working with Node Package Manager(NPM).
CO-4	Build a web server usingExpress.js
CO-5	Make use of Typescript to optimize JavaScript code by using the concept of strict type checking.

SITE18 Regulation
B.Tech.-Information Technology

I Year I Semester			
S.No.	**Name of the Course**	**CO No.**	**Course Outcome**
1	Engineering Mathematics-I		On completion of this course, students are able to
		C111.1	Solve system of linear equations
		C111.2	Find Eigen values and Eigen vectors of a matrix
		C111.3	Solve initial value problems by using Laplace transforms
		C111.4	Find the solution of algebraic/ transcendental equations and also interpolate the functions.
		C111.5	Evaluate numerical integration and to solve ordinary differential equations by using numerical
		C111.6	Find Fourier series of a periodic function and to determine the Fourier transform of a function
2	Engineering Physics		On completion of the course student will able to
		C112.1	Understand the conditions for invariance and non invariance of Newton's second law.
		C112.2	Distinguish the various harmonic motions and resonance.
		C112.3	Apply Kepler's laws to understand the planetary motions.
		C112.4	Formulate Five-term acceleration formula with consideration of earth rotation effect.
		C112.5	Understanding the concept of conservative and non conservative force fields.
		C112.6	Describe the rigid body dynamics and moment of inertia
3	Programming For Problem Solving		On completion of the course student will able to
		C113.1	Formulate algorithms, translate them into programs and correct program errors.
		C113.2	Choose right control structures suitable for the problem to be solved.
		C113.3	Decompose reusable code in a program into functions.
		C1134	Make use of arrays, pointers, structures and unions effectively.
		C113.5	Store and retrieve data from permanent storage.
		C113.6	Learn file operations
4	Engineering Graphics		Students will be able to construct Polygons using general methods, inscribe and describe polygons on circles, draw curves
		C114.1	Students will be able to read, interpret and construct plain scales, diagonal scales and vernier scales
		C114.2	Student will be able to draw orthographic projections of points, lines, Planes & Solids inclined to one reference plane
		C114.3	Student will be able to draw sections and sectional views of Solids
		C114.4	Student will be able to draw isometric view of lines, plane figures and simple solids.
		C114.5	Student will be able to draw objects using draw and modify toolbars of AutoCAD
		On completion of the course student will able to	

		C115.1	understand the concept of ecosystem and its diversity
		C115.2	Helps the student to understand the concept of ecosystem and its diversity.
		C115.3	Helps the student to gain knowledge on natural resources.
		C115.4	to understand the concept of biodiversity.
		C115.5	Student gains knowledge on various types of environmental pollution.
5	Environmental Science	C115.6	Student gain knowledge on environmental legislation and global treaties
I Year II Semester			
S.No.	**Name of the Course**	**CO No.**	**Course Outcome**
			On Completion of the course student will acquire
		C121.1	Ability to understand Scientific vocabulary and use them confidently
		C121.2	Familiarity with the basic principles of writing clear sentences and paragraphs
		C121.3	Ability to write error free simple technical passages
		C121.4	Knowledge of writing different writing styles
		C121.5	Confidence to write letters and technical reports clearly and coherently
1	Technical English	C121.6	Get inspired by achievements and values upheld by a renowned technocrat.
			On completion of this course, students are able to
		C122.1	Solve first order differential equations.
		C122.2	Solve linear differential equations with constant coefficients.
		C122.3	Find the extreme of a function.
	Engineering Mathematics-II	C122.4	Solve partial differential equations
		C122.5	Evaluate multiple integrals
2		C122.6	Verify vector integral theorems
			On completion of the course student will be
		C123.1	Able to rationalise periodic properties like ionization potential, electro negativity and oxidation states.
		C123.2	Able to know the nature and working of various electrodes.
		C123.3	Able to analyze bulk properties and processes using thermodynamic considerations.
		C123.4	Able to synthesize organic molecules using different types of chemical reactions.
3	Engineering Chemistry	C123.5	Able to understand the concepts of atomic and molecular orbital's.
		C123.6	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum
			On completion of the course student will be
		C124.1	Able to analyze DC circuits by using KCL, KVL and Network theorems

4	Basic Electrical Engineering	C124.2	Able to analyze AC circuits
		C124.3	Able to explain the operation and compute performance of transformer
		C124.4	Able to explain the construction and working of rotating electrical machines
		C124.5	Able to describe DC-DC and DC-AC converters
		C124.6	Able to explain about types of LV switch gear and types of batteries
5	Constitution Of India, Professional Ethics & Human Rights		On completion of the course student will
		C125.1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
		C125.2	Understand state and central policies, fundamental duties.
		C125.3	Understand Electoral Process, special provisions.
		C125.4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and
		C125.5	Understand Engineering ethics and responsibilities of Engineers
		C125.6	Understand Engineering Integrity & Reliability
II B. Tech I Semester (Autonomous)			
S.No	**Name of the Course**	**CO No.**	**Course Outcome**
1	Mathematics –III	C211.1	Demonstrate the basics of a complex analysis to find the function of a complex variable. [BT2 : Understand]
		C211.2	Evaluate the line integral, Using the Cauchy's formulae and expand functions using Taylor's, Mac Laurent series [BT5 : Evaluate]
		C211.3	Evaluate complex integrals using residue methods. [BT5 : Evaluate]
		C211.4	Explain the basics of probability and discrete, continuous distributions to fit data [BT2 : Understand]
		C211.5	Test the hypothesis for means, proportions and variances [BT4 : Analyze]
2	Digital Electronics (DE)	C212.1	Explain fundamental gates in digital circuits and Convert different type of codes and number systems which are used in digital communication and computer systems. [BT2 : Understand]
		C212.2	Select different logic families. Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency. [BT4: Analyze]
		C212.3	Discuss the simplification methods of Boolean algebra. Illustrate reduction of logical expressions using Boolean algebra, k-map and tabulation method and implement the functions using logic gates. [BT2 : Understand]
		C212.4	Describe and Design the sequential circuits & systems. Design different types of with and without memory element digital electronic circuits using flip-flops for particular operation, within the realm of economic, performance, efficiency, user friendly and environmental constraints AND operation of A/D and D/A converters and different types of converters. [BT2 : Understand]

		C212.5	Describe Semiconductor memories and Programmable logic devices. Assess the nomenclature and technology in the area of memory devices and apply the memory devices in different types of digital circuits for real world application. Implement combinational logic circuits using programmable logic devices. [BT2 : Understand]
		C213.1	Analyze the rectifier, clipping and clamping circuits.[BT4 : Analyze]
3	Analog ElectronicsCircuits (AEC)	C213.2	Explain the construction andcharacteristics.[BT2:Understand]
		C213.3	Analyze the circuits of MOSFET.[BT4 : Analyze]
		C213.4	Compare different types of amplifiers.[BT2:Understand]
		C213.5	Illustrate the design of linear and non-linear applications of Op-Amp.[BT2:Understand]
4	Mathematics (DM)	C214.1	Distinguish between Statement Logic and Predicate Logic. [BT2 : Understand]
		C214.2	Apply mathematical proving techniques in order to solve recurrences and elementary algebra problems [BT3 : Apply]
		C214.3	Illustrate by examples terminology, operations and mathematical models using theories of sets, relations and functions [BT3 : Apply]
		C214.4	Apply permutations & Combinations in problem solving [BT3 : Apply]
		C214.5	Explain basic properties of algebraic structures [BT3 : Apply]
5	Data Structures(DS)	C215.1	Analyze the algorithms to determine the time and computation complexity and justify the correctness. [BT4 : Analyze]
		C215.2	Implement Stacks and Queues and usage in real-world applications.[BT3: Apply]
		C215.3	Implement single and double linked lists it and usage in real-world applications. [BT3: Apply]
		C215.4	Construct binary Trees, BST and its traversal algorithms [BT3: Apply]
		C215.5	Construct AVL, tries, red black, B and B+ trees. [BT3: Apply]
6	Data Structures Lab (DS Lab)	P211.1	Analyze the algorithms to determine the time and computation complexity and justify the correctness. [BT4 : Analyze]
		P211.2	Implement Stacks and Queues and usage in real-world applications.[BT3: Apply]
		P211.3	Implement single and double linked lists it and usage in real-world applications. [BT3: Apply]
		P211.4	Construct binary Trees, BST and its traversal algorithms. [BT3: Apply]
		P211.5	Construct AVL, tries, red black, B and B+ trees. [BT3: Apply]
7	Analog Electronics Circuits /Digital Electronics Lab (AEC/DE Lab)	P212.1	Analyze the rectifier, clipping and clamping circuits.[BT4 : Analyze]
		P212.2	Explain the construction and characteristics.[BT2:Understand]
		P212.3	Analyze the circuits of MOSFET.[BT4 : Analyze]
		P212.4	Compare different types of amplifiers.[BT2:Understand]
		P212.5	Illustrate the design of linear and non-linear applications of Op-Amp.[BT2:Understand]

8	IT Workshop Lab(ITW Lab)	P213.1	Demonstrate the need for simulation/implementation for the verification of mathematical functions.[BT2 : Understand]
		P213.2	Demonstrate the main features of the SCILAB program development environment to enable their usage in the higher learning. [BT2 : Understand]
		P213.3	Develop control flow of the program.[BT3 : Apply]
		P213.4	Implement simple mathematical functions/equations in numerical computing environment such as SCILAB [BT3 : Apply]
		P213.5	Implement simple mathematical functions and operations thereon using plots/display. [BT3 : Apply]
II B. Tech II Semester (Autonomous)			
S.No	**Name of theCourse**	**CO No.**	**Course Outcome**
1	Signals & Systems(SS)	C221.1	Classify the signals and systems [BT2 : Understand]
		C221.2	Demonstrate the Behavior of continuous and discrete-time LTI systems [BT2 : Understand]
		C221.3	Analyze the continuous-time signals and systems using relevant transforms[BT4 :Analyze]
		C221.4	Apply z-transform to analyze discrete-time signals and systems[BT3 : Apply]
		C221.5	Apply sampling theorem to convert CT signals to DT signals and reconstruction. [BT3 : Apply]
2	Engineering Mechanics(EM)	C222.1	Distinguish effect of resultant forces and moments of a force system and friction. [BT4 :Analyze]
		C222.2	Construct complete and correctly labeled Free Body Diagrams of rigid bodies or systems of rigid bodies in static equilibrium. [BT3 : Apply]
		C222.3	Analyze the centroid and moment of inertia of the 2-D bodies using the method of composite area. [BT4 : Analyze]
		C222.4	Apply fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems. [BT3 : Apply]
		C222.5	Determine the complete motion of a rigid body resulting from an application of a system of forces, using work energy and impulse momentum principles. [BT5 : Evaluate]
		C223.1	Explain the basic sub systems of a computer, their organization, structure and operation. [BT2 : Understand]
3	Computer Organization(CO)	C223.2	Discuss the concept of programs as sequences of machine instructions. [BT2 : Understand]
		C223.3	Explain the execution of complete instruction sets. [BT2 : Understand]
		C223.4	Differentiate memory hierarchy and concept of memory management. [BT2 : Understand]
		C223.5	Interpret the various way of communication with I/O devices and standard I/O interfaces. [BT2 : Understand]
		C224.1	Apply dynamic programming, greedy strategy techniques to solve the problems. [BT3 : Apply]
		C224.2	Apply algorithm design principles to derive solutions for real life problems. [BT3 : Apply]

4	Algorithm Design & Analysis(ADA)	C224.3	Interpret major graph algorithms to model engineering problems. [BT2 : Understand]
		C224.4	Demonstrate variations among traceable and intractable problems. [BT3 :Apply]
		C224.5	Apply various approximations and Randomized Algorithms, when an algorithmic design situation calls for it. [BT3 : Apply]
5	Java Programming(JP)	C225.1	Make use of classes, interfaces and packages. [BT3 : Apply]
		C225.2	Apply inheritance, polymorphism and encapsulation to classes. [BT3 : Apply]
		C225.3	Implement user defined exceptions. [BT3 : Apply]
		C225.4	Create Threads to parallelize operations. [BT6 : Create]
		C225.5	Create rich userinterface applications using modern API JavaFX. [BT6 : Create]
6	Computer Organization Lab(CO Lab)	P221.1	Apply the programing knowledge for arithmetic and logical operations in 8085. [BT3 : Apply]
		P221.2	Develop the programs for generation. [BT6 : Create]
		P221.3	Develop the programs for operations on memory. [BT6 : Create]
		P221.4	Develop the programs for Conversion of one type to another type. [BT6 : Create]
		P221.5	Develop the programs for Search operations. [BT6 : Create]
7	Algorithm Design & Analysis (ADA Lab)	P222.1	Apply dynamic programming, greedy strategy techniques to solve the problems. [BT3 : Apply]
		P222.2	Apply Back Tracking, Branch and Bound principles to derive solutions for real life problems. [BT3 : Apply]
		P222.3	Interpret major graph algorithms to model engineering problems. [BT3 : Apply]
		P222.4	Demonstrate variations among traceable and untraceable problems. [BT3 : Apply]
		P222.5	Apply various approximations and Randomized Algorithms, when an algorithmic design situation calls for it. [BT3 : Apply]
8	Java Programming Lab(JP Lab)	P223.1	Build software development skills using java programming for real world applications. [BT3 : Apply]
		P223.2	Implement basic problems using Java. [BT3 : Apply]
		P223.3	Make use of multithreading concepts to handle exceptions. [BT3 : Apply]
		P223.4	Develop programs using java collection API as well as java Standard Library. [BT3 : Apply]
		P223.5	Develop Graphical User Interface applications using JavaFX. [BT3 : Apply]
III B. Tech I Semester (Autonomous)			
S.No	**Name of theCourse**	**CO No.**	**Course Outcome**
1	Biology for Engineers(BE)	C311.1	Describe how biological observations of 18th Century that lead to major discoveries. [BTL2 : Understand]
		C311.2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological. [BTL2 : Understand]
		C311.3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring[BTL2 : Understand]

		C311.4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine[BTL2 : Understand]
		C311.5	Classify enzymes and distinguish between different mechanisms of enzyme action, to convey that "Genetics is to biology what Newton's laws are to Physical Sciences[BTL3 : Apply]
2	Personality Development & Professional Communication(PD&PC)	C312.1	Understand Personality development process and learn to implement effective techniques.
		C312.2	Understand Personality development process and learn to implement effective techniques. [BT2 : Understand]
		C312.3	Understand how people behave and regulate self-behaviors and learn to work in a team. [BT2 : Understand]
		C312.4	Know their career values, identify their skills, set goals for enhancing their career skills and prepare for interviews[BT1 : Knowledge]
		C312.5	Understand and learn how to deal with problems and practice problem solving skills. [BT2 : Understand]
3	Management Science(MS)	C313.1	Understand and apply the concept of management and administration, functions of management. [BT2 : Understand]
		C313.2	Analyze operations management and inventory management techniques. [BT4 : Analyze]
		C313.3	Analyze the importance of human resources and their functions and marketing strategies to promote the products. [BT4 : Analyze]
		C313.4	Apply the knowledge of project management techniques to complete the project in optimum cost and time. [BT3 : Apply]
		C313.5	Analyze components of strategic management. [BT4 : Analyze]
4	Database Systems (DBS)	C314.1	Describe the basic concepts, applications and architecture of a database[BT2 : Understand]
		C314.2	Restate the relational database model with SQL, interpret constraints associated with relational database model. [BT2 : Understand]
		C314.3	Demonstrate simple and moderately advanced database queries using Structured Query Language (SQL). [BT3 : Apply]
		C314.4	Model database schema using normalization. [BT3 : Apply]
		C314.5	Explain database recovery methods [BT2: Understand]
5	Operating Systems (OS)	C315.1	Design various Scheduling algorithms, Apply the principles of concurrency. [BTL3 : Apply]
		C315.2	Design deadlock, prevention and avoidance algorithms. [BTL3 : Apply]
		C315.3	Compare and contrast various memory management schemes. [BTL3 : Apply]
		C315.4	Design and Implement a prototype file system, Perform administrative tasks on Linux Servers. [BTL3 : Apply]
		C315.5	Understand to Android Operating System Internals. [BTL2 : Understand]
		P311.1	Demonstrate transmedia network protocols [BT3 : Apply]

7	Advanced Java & Web Technologies Lab (AJ& WT Lab)	P311.2	Build the applications by using JDBC API [BT6 : Create]
		P311.3	Apply PHP for developing small to large scale real time web applications. [BT3 : Apply]
		P311.4	Design Applications by using sessions [BT3 : Create]
		P311.5	Design Applications by using Cookies [BT6 : Create]
8	Unix & Operating Systems Lab (U&OS Lab)	P312.1	Identify the basic concepts and functions of Operating Systems [BT3 : Apply]
		P312.2	Compute the process scheduling and identify the process concepts. [BT3 : Apply]
		P312.3	Compare various memory management schemes. [BT4 : Analyze]
		P312.4	Evaluate synchronization mechanisms and understand deadlocks. [BT5 : Evaluate]
		P312.5	Explain I/O management and File Systems. [BT2 : Understand]
9	Database Systems Lab (DBS Lab)	P313.1	Create,maintain and manipulate a relational database using SQL. [BT6 : Create]
		P313.2	Interpret ER model and normalization for database design. [BT2 : Understand]
		P313.3	Analyze issues in data storage and query processing and can formulate appropriate solutions [BT4 :Analyze]
		P313.4	Anlayze the role and issues in management of data such as efficiency, privacy, security, ethical responsibility and strategic advantage. [BT4 :Analyze]
		P313.5	Design and build database system for a given real world problem. [BT6 : Create]

III B. Tech II Semester (Autonomous)

S. No	Name of the Course	CO No.	Course Outcome
1	Computer Networks(CN)	C321.1	Understand OSI and TCP/IP models[BTL2 : Understand]
		C321.2	Analyze MAC layer protocols and LAN technologies[BTL3 : Apply]
		C321.3	Design applications using internet protocols[BTL3 : Apply]
		C321.4	Understand routing and congestion control algorithms[BTL2 : Understand]
		C321.5	Understand how internet works. [BTL2 : Understand]
2	Software Engineering (SE)	C322.1	Define and understand Software, Software Engineering and Process Models. [BTL1 : Knowledge]
		C322.2	Analyze Requirements and Specification of Software and its Design. [BTL4 : Analyze]
		C322.3	Describe Function-Oriented Design concepts and User Interface Design concepts [BTL1 : Knowledge]
		C322.4	Develop code and design test cases for testing techniques. [BTL3 : Apply]
		C322.5	Discuss Software Reliability and Software Quality Management. [BTL2 : Understand]
		C323.1	Define interfaces, and GUI's[BT 1 (define) CO 1]
		C323.2	Identify the Design of user interface process models and methods [BT 2 (identify) CO 2]

3	UI Design (UI)	C323.3	Understanding the business tools and requirements [BT 1,(understand) CO 3]
		C323.4	classify of menus and graphical menus and navigation menus[BT 2,(classify) CO 4]
		C323.5	Ability to communicate and apply UCD methods [BT 3 (apply) CO 5]
4	Mathematical Optimization (MO)	C324.1	Understand mathematical modelling, graphical method. [BT1 : Remember]
		C324.2	Solve LPP by Simplex methods. [BT2 : Understand]
		C324.3	Determine minimum Transportation costs, use of Assignment models in business & industry. [BT2 : Understand]
		C324.4	Solve Queuing problems. [BT2 : Understand]
		C324.5	Apply knowledge of Inventory management, Project management. [BT3 : Apply]
5	Engineering Economics& Financial Management (EEFM)	C325.1	Equipped with the knowledge of managerial economics and estimating demand for a product. [BTL2 : Understand]
		C325.2	Understand Production and Cost concepts, estimating Cost Break even Analysis. [BTL2 : Understand]
		C325.3	Equipped with the knowledge on Markets and Pricing methods along with Business Cycles. [BTL2 : Understand]
		C325.4	Understand Accounting Concepts and Prepare Financial Statements- Analysis[BTL2 : Understand]
		C325.5	Analyze various investment project proposals with the help of Capital Budgeting techniques. [BTL3 : Apply]
7	Python Programming Lab(PP Lab)	P321.1	Explain scripting and interpreted language by using modern tools to make software easily right out of the box for creating and running programs. [BT2 : Understand]
		P321.2	Demonstrate various problem solving approaches that can manipulate static, structured data using Python. [BT3 : Apply]
		P321.3	Determine the kind of data structure most appropriate for solving a given problem. [BT3 : Apply]
		P321.4	Apply the concepts of functions, modules and packages to build software for real needs. [BT3 : Apply]
		P321.5	Analyze the importance and develop applications for real time problems as a team by applying object oriented programming concepts. [BT4 : Analyze]
8	Software Engineering Lab(SE Lab)	P322.1	Define and understand Software, Software Engineering and Process Models. [BTL1 : Remember]
		P322.2	Analyze Requirements and Specification of Software and its Design. [BTL4 : Analyze]
		P322.3	Describe Function-Oriented Design concepts and User Interface Design concepts [BTL1 : Remember]
		P322.4	Develop code and design test cases for testing techniques. [BTL3 : Apply]
		P322.5	Discuss Software Reliability and Software Quality Management. [BTL2 : Understand]

IV B. Tech I Semester (Autonomous)			
S.No	**Name of the Course**	**CO No.**	**Course Outcome**
1	Cryptography and Network security(CNS)	C411.1	Summarize with information security awareness and a clear understanding of its importance.
		C411.2	Summarize fundamentals of secret and public cryptography
		C411.3	Describe master protocols for security services
		C411.4	Summarize with network security threats and countermeasures
		C411.5	Summarize with network security designs using available secure solutions (such as PGP, SSL, IPSec, etc).
2	CLOUD COMPUTING (CC)	C412.1	Summarize importance of cloud computing in real world.
		C412.2	Identify applications that can be integrated using cloud services.
		C412.3	Evaluate cloud-based applications.
		C412.4	Understand the security issues in cloud services.
		C412.5	Identify the cloud services managing
3	R PROGRAMMING (RP)	C413.1	List motivation for learning a programming language
		C413.2	Access online resources for R and import new function packages into the R workspace
		C413.3	Import, review, manipulate and summarize data-sets in R
		C413.4	Explore data-sets to create testable hypotheses and identify appropriate statistical tests
		C413.5	Perform appropriate statistical tests using R Create and edit visualizations
4	Robotics (ROBO)	C414.1	Identify various robot configurations and components
		C414.2	Select appropriate actuators and sensors for a robot based on specific application.
		C414.3	Carry out kinematic and dynamic analysis for simple kinematic chains.
		C414.4	Analyze forces in links and joints of a robot.
		C414.5	Perform trajectory planning for a robot manipulator.
5	Interneet of Things (IoT)	C415.1	Demonstrate different IoT levels with protocols. [BT2: Understand]
		C415.2	Compare IoT and M2M. [BT2 : Understand]
		C415.3	Make use of python for logical design of IoT systems. [BT2 : Understand]
		C415.4	Apply different frameworks like Django, Xively cloud and AWS for IoT. [BT3 : Apply]
		C415.5	Develop applications like home automation, smart parking using IoT. [BT6 : Create]
7	OBJECT ORIENTED ANALYSIS AND DESIGN	P411.1	Understand the Case studies and design the Model.
		P411.2	Understand how design patterns solve design problems.
		P411.3	Develop design solutions using creational patterns.
		P411.4	Construct design solutions by using structural and behavioural patterns

	LAB	P411.5	Construct creational patterns by applicable patterns for given context.
8		P312.1	Identify the basic concepts and functions of Operating Systems [BT3 : Apply]
		P312.2	Compute the process scheduling and identify the process concepts. [BT3 : Apply]
		P312.3	Compare various memory management schemes. [BT4 : Analyze]
		P312.4	Evaluate synchronization mechanisms and understand deadlocks. [BT5 : Evaluate]
		P312.5	Explain I/O management and File Systems. [BT2 : Understand]
9	Database Systems Lab(DBS Lab)	P313.1	Create,maintain and manipulate a relational database using SQL. [BT6 : Create]
		P313.2	Interpret ER model and normalization for database design. [BT2 : Understand]
		P313.3	Analyze issues in data storage and query processing and can formulate appropriate solutions [BT4 :Analyze]
		P313.4	Anlayze the role and issues in management of data such as efficiency, privacy, security, ethical responsibility and strategic advantage. [BT4 :Analyze]
		P313.5	Design and build database system for a given real world problem. [BT6 : Create]
IV B. Tech II Semester (Autonomous)			
S. No	**Name of the Course**	**CO No.**	**Course Outcome**
1	DISTRIBUTED DATABASES(DS)	C321.1	Understand relational database management systems, normalization to make efficient retrieval from database and query.
		C321.2	Understand the architecture of distributed database design
		C321.3	Understand the relational algebra operations.
		C321.4	Understand the parallelization of various operations.
		C321.5	Analyze the distributed object database management systems
	OPEN SOURCE SOFTWARE(OSS)	C322.1	Make use of advanced concepts like scheduling, signals to work with processes efficiently.
		C322.2	applications.
		C322.3	Make use of simple and large scale real time applications using OSS programming language like PHP.

2		C322.4	Apply the concepts of Python functions, modules and packages to build software for real needs.
		C322.5	Develop programs using concepts of PERL and RUBY
3	(CMC)	C323.1	Learn Basic concepts of Cellular System
		C323.2	Identify Co-channel and Non co-channel Interference
		C323.3	Know the concepts Cell coverage for signal
		C323.4	Choose proper cell site antenna
		C323.5	Apply different methods of Channel Assignment and Handoff mechanisms
4	SOFTWARE PROJECT MANAGEMENT (SPM)	C324.1	Describe basic concepts and issues and planning in software project management
		C324.2	Choose the appropriate life cycle model for software management process
		C324.3	Compute Effort estimation techniques and critical path
		C324.4	Explain Risk management process and PERT technique
		C324.5	Develop the skills for tracking and controlling software deliverables

SITE21 Regulation

B.Tech.-Information Technology

I Year I Semester			
S.No.	**Name of the Course**	**CO No.**	**Course Outcome**
1	Technical English(21CMEGT1010)	C111.1	Ability to understand Scientific vocabulary and use them
		C111.2	Familiarity with the basic principles of writing clear sentences and paragraphs
		C111.3	Ability to write error free simple technical passages
		C111.4	Knowledge of writing different writing styles
		C111.5	Confidence to write letters and technical reports clearly and coherently
2	Engineering Mathematics – I(21CMMAT102 0)	C112.1	Solve the differential equations related to various engineering
		C112.2	Solve the differential equations of higher order related to
		C112.3	familiarize with functions of several variables which is useful
		C112.4	Solve the partial partial differential equations of first order (L3)
		C112.5	Apply double integration techniques in evaluating areas
3	Basic ElectricalEngineering (21CMEET1030)	C113.1	Understand basic electrical circuit operation.
		C113.2	Understand the concept of Alternating Voltage and Current.
		C113.3	Understand the operation of DC machines.
		C113.4	Understand the working of measuring instruments.
		C113.5	Understand the operation of different types of ac machines.
4	Programming for Problem Solving (21CMCST1040)	C114.1	Demonstrate computer components, algorithms, translate them
		C114.2	Choose thesuitable control structures for the problem to besolved.
		C114.3	Make use of arrays, pointers, structures,and unions effectively.
		C114.4	Organize reusable code in a program into functions.
		C114.5	Demonstration of file operations.
5	Computer AidedEngineering Graphics (21ITMEL1050)	C115.1	understand the BIS conventions of engineering drawing with basic concepts&draw engineering objects with
		C115.2	construct polygons, various types of Curves and scales usedengineering application like maps, buildings, bridges
		C115.3	draw multi views of points, lines and planes by orthographic projection method
		C115.4	draw multi views of solids by orthographic projection method
		C115.5	convert the orthographic views into isometric views and viceversa by 2D- Commands in AutoCAD
6	English Communication Skills Lab (21CMEGL1060)	P111.1	Proficiency in English for Listening Comprehension
		P111.2	Proficiency in English for Pronunciation
		P111.3	Proficiency in English for Dialogues

		P111.4	Proficiency in English for Interpersonal Communication Skills
		P111.5	Proficiency in English for Presentations
7	Basic Electrical Engineering Lab (21CMEEL1070)	P112.1	Verify the Kirchoff's laws
		P112.2	Verify network theorems for a given circuit.
		P112.3	Control the speed of DC motor.
		P112.4	Analyze performance of single phase induction motor
		P112.5	Analyze performance of three phase induction motor.
		P112.6	Identify different types of earthings
8	Programming forProblem SolvingLab (21CMCSL1080)	P113.1	Attain knowledge on using CODE BLOCKS and RAPTOR
		P113.2	Examine and analyze alternative solutions to a problem.
		P113.3	Design an algorithmic solution to a problem using problemdecomposition and step- wise refinement.
		P113.4	Demonstrate conversion of iterative functions to recursive and vice-versa.
		P113.5	Implement the concepts of arrays, structures, Unions and files.
9	Environmental Science (21CMESN1090)	N111.1	Obtain knowledge on global warming & climate change -
		N111.2	Preserve several natural resources
		N111.3	Summarize the concept of ecosystem
		N111.4	Control different types of pollution
		N111.5	Understand social issues and environmental legislation
I Year II Semester			
S.No.	**Name of theCourse**	**CO No.**	**Course Outcome**
1	Engineering Mathematics - II (21CMMAT2010)	C121.1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications and solve system of linearequations (L6)
		C121.2	Find the inverse and power of a matrix by Cayley-Hamiltontheorem and reduce the Quadratic form (L3)
		C121.3	Solve initial value problems by using Laplace transforms (L3)
		C121.4	Find the solution of algebraic/ transcendental equations and also interpolate the functions(L3)
		C121.5	Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to itsanalytical computations (L3).
2	Engineering Physics (21ITPHT2020)	C122.1	Understand the theoretical view of electrical conductivity inmetals using free electron theory and quantum mechanics.
		C122.2	Estimate the statistical calculation and the theoretical view
		C122.3	Generalization of the light-matter interaction mechanisms.
		C122.4	Describe the basic laser physics and working of lasers.
		C122.5	Illustrate the construction and working function of LEDs.
		C122.6	Analyze the construction and working of photo diodes and solar cells.

3	Engineering Chemistry (21CMCHT2030)	C123.1	Interpret the mechanism of corrosion
		C123.2	Summarize the problems faced in industries due to boiler troubles.
		C123.3	Recall the properties and applications of advanced materials.
		C123.4	Summarize the advantages of non-conventional energy resources and batteries.
		C123.5	Able to gain knowledge on spectroscopic techniques and theranges of the electromagnetic spectrum used for exciting different molecular energy levels.
		C123.6	Determine the strength of acid, base and some elements byvolumetric and instrumental analysis.
4	Python Programming (21CMCST2040)	C124.1	Explain thefundamental concepts in the Python language.
		C124.2	Implementation of python iterative statements and strings.
		C124.3	Demonstrate python lists, dictionaries, and functions.
		C124.4	Understand the concepts of modules and packages in python.
		C124.5	Complete coding challenges related to object-oriented programming.
		C124.6	Apply variety of error handling and GUI programming techniques.
5	Data Structures(21ITITT2050)	C125.1	Discuss the Basics of data structures and computationalefficiency of algorithms for sorting & searching.
		C125.2	Illustration of linked lists and its operations.
		C125.3	Design programs using a variety of data structures such as stacks and queues.
		C125.4	Demonstrate different tree traversing method.
		C125.5	Describing the graphs concepts.
6	Engineering Physics Lab (21ITPHL2060)	P121.1	Compare the theory and correlated with experiments.
		P121.2	Design experiments.
		P121.3	Analyze the experimental result.
		P121.4	Apply appropriate techniques to perform the experiments.
		P121.5	Understand the interaction of the light with semiconductor.
		P121.6	Study the characteristic curves of the optoelectronic semiconductor devices.
8	Data StructuresLab (21ITITL2080)	P123.1	Solve various searching and sorting problems.
		P123.2	Making use of basic data structures such as arrays and linked list to solve problems.
		P123.3	Implement stacks and queues using linked list
		P123.4	Implement tree traversal techniques for the binary trees
		P123.5	Implement graph traversals, minimal spanning tree and shortest path.
9	Constitution of India, Professional Ethics & Human Rights (21CMMSN2090)	N121.1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
		N121.2	Understand state and central policies, fundamental duties.
		N121.3	Understand Electoral Process, special provisions.
		N121.4	Understand powers and functions of Municipalities,Panchayats and Co-operative Societies,
		N121.5	Understand Engineering ethics and responsibilities of Engineers
		N121.5	Understand Engineering Integrity & Reliability

II Year I Semester			
S.No.	**Name of the Course**	**CO No.**	**Course Outcome**
1	Probability Distributions &Statistical Methods (21CMMAT3010)	C211.1	Apply least squares method to fit a curve
		C211.2	Analysis the data and evaluate the central tendency of data.
		C211.3	Apply the Concepts of Probability and Find the statisticalParameters of Discrete and Continuous distributions
		C211.4	Estimate the properties of population from samples
		C211.5	Design the Components of classical Hypothesis test, Conclude the statistical inferential methods based on small and large samples
2	Analog & DigitalElectronics (21ITECT3020)	C212.1	Understand the characteristics and utilization of various components.
		C212.2	Understand and analyze the BJT and MOSFET
		C212.3	Apply the Boolean algebra to optimize the logic functionsusing K-maps and nderstand the field effect transistors
		C212.4	To design and analyze combinational logic circuits
		C212.5	To design and analyze sequential logic circuits.
3	Computer Organization (21ITITT3030)	C213.1	Understand and apply computer arithmetic on binary number
		C213.2	Understand and design basic computer organization
		C213.3	Design & Develop instruction set for basic computer
		C213.4	Design & Develop control unit for basic computer
		C213.5	Exemplify in a better way the I/O and memory organization.
4	Java Programming (21ITITT3040)	C214.1	Able to realize the concept of Object-Oriented
		C214.2	Able to describe the basic concepts of Java such as operators, classes, objects, inheritance, packages,Enumeration, and various keywords
		C214.3	Apply the concept of exception handling and Input/ Output operations
		C214.4	Able to design the applications of Java & Java applet
		C214.5	Able to Analyze & Design the concept of Event Handling and Swing
5	Data Base Management Systems (21ITITT3050)	C215.1	Recognize the basic elements of a relational database
		C215.2	Draw entity relationship and convert entity relationship diagrams into RDBMS.
		C215.3	Create, maintain, and manipulate a relational database using SQL.
		C215.4	Designs and applies normalization techniques for logical schema model.
		C215.5	Solves concurrent issues and problems through locking mechanism.
6	Analog & DigitalElectronics Lab (21ITECL3060)	P211.1	Understand the characteristics of PN Diode and Zener diode
		P211.2	Analyze the characteristics of BJT
		P211.3	Analyze the characteristics of MOSFET

		P211.4	Construct and demonstrate the functionality of Combinational circuits
		P211.5	Construct and demonstrate the functionality of Sequential circuits
7	Java Programming Lab (21ITITL3070)	P212.1	Evaluate default value of all primitive data type, Operations,Expressions, Control flow, Strings.
		P212.2	Determine Class, Objects, Methods, Inheritance, Exception,Runtime Polymorphism, User defined Exception handling mechanism.
		P212.3	Illustrating simple inheritance, multi-level inheritance, Exception handling mechanism.
		P212.4	Construct Threads, Event Handling, implement packages
		P212.5	Construct applications using applets.
8	Data Base Management Systems Lab (21ITITL3080)	P213.1	Explore the concepts of SQL built in functions.
		P213.2	Design and implement a database schema for a given problem-domain, Normalize a database
		P213.3	Populate and query a database using SQL DML/DDL commands.
		P213.4	Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS
		P213.5	Practice PL/SQL including stored procedures, stored functions, cursors, packages.
9	Data Science Using Python(21ITITS3090)	S211.1	Perform various operations on numpy arrays.
		S211.2	Importing data from different file formats using pandas.
		S211.3	Apply various techniques to extract data from websources.
		S211.4	Explore various preprocessing techniques to handle Data Sets.
		S211.5	Draw different types of charts using matplotlib
10	Biology forEngineers (21CMBIN3100)	N211.1	Describe how biological observations of 18th Century that lead to major discoveries.
		N211.2	Convey that classification is not what biology is all about but highlight the underlying criteria, such as morphological,biochemical and ecological.
		N211.3	Highlight the concepts of recessiveness and dominanceduring the passage of genetic material from parent to offspring
		N211.4	Convey that all forms of life have the same building blocksand yet the manifestations are as diverse as one can imagine
		N211.5	Classify enzymes and distinguish between differentmechanisms of enzyme actions
II Year II Semester			
1	Discrete Mathematics (21CMMAT4010)	C221.1	Analyze natural language arguments by means of symbolic propositional logic.
		C221.2	Identify and manipulate basic mathematical objects such as sets, functions, and relations.
		C221.3	Use of basic theorems in number theory to solve exponential problems.
		C221.4	Solve recurrence relations by using different methods.

		C221.5	Apply graph theory concepts to solve real-time problems.
2	Engineering Economics & Financial Management (21ITMST4020)	C222.1	Express knowledge of managerial economics and estimating demand for a product.
		C222.2	Recognize Production and Cost concepts, estimating Cost Break even Analysis.
		C222.3	Express knowledge on Markets and Pricing methods along with Business Cycles.
		C222.4	Apply Accounting Concepts and Prepare Financial Statements- and Analysis
		C222.5	Analyze various investment project proposals with the help of Capital Budgeting techniques.
3	Operating systems (21ITITT4030)	C223.1	Demonstrate knowledge on Computer System organization and Operating system services.
		C223.2	Design solutions for process synchronization problems byusing System calls and Inter process communication.
		C223.3	Identify the functionality involved in process managementconcepts like scheduling and synchronization.
		C223.4	Design models for handling deadlock and perform memory management.
		C223.5	Analyze services of I/O subsystems and mechanisms of security & protection.
4	Design and Analysis of Algorithms (21ITITT4040)	C224.1	Demonstrate asymptotic notation and divide and conquer technique.
		C224.2	Use greedy technique to solve various problems.
		C224.3	Demonstrate dynamic programming technique to various problems.
		C224.4	Develop algorithms using backtracking technique.
		C224.5	Demonstrate branch and bound technique to various problems.
5	Software Engineering (21ITITT4050)	C225.1	Define and develop a software project from requirement gathering to implementation.
		C225.2	Obtain knowledge about principles and practices of software engineering
		C225.3	Focus on the fundamentals of software project
		C225.4	Focus on modelling a software project
		C225.5	Obtain knowledge about estimation and maintenance of software systems
6	Operating systems Lab(21ITITL4060)	P221.1	Implement CPU scheduling algorithms.
		P221.2	Describe deadlock avoidance and prevention algorithms.
		P221.3	Interpret page replacement and memory management algorithms.
		P221.4	Apply the process management concepts & Techniques.
		P221.5	Describe the storage management concepts.
7	Design and Analysis ofAlgorithms Lab (21ITITL4070)	P222.1	For a given algorithms analyze worst-case running times of algorithms based on asymptotic analysis and justify thecorrectness of algorithms.
			Describe the greedy paradigm and explain when analgorithmic design situation calls for it.

		P222.2	For a given problemdevelop the greedy algorithms.
		P222.3	Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Synthesizedivide-and-conquer algorithms. Derive and solve recurrence relation.
		P222.4	Describe the dynamic-programming paradigm and explainwhen an algorithmic design situation calls for it.
		P222.5	For a given problem of dynamic-programming an developthe dynamic programming algorithms and analyze it to determine its computational complexity.
8	Software Engineering Lab(21ITITL4080)	P223.1	Attain knowledge on preparing SRS document
		P223.2	Estimate the cost of the project.
		P223.3	Design ER and DFD Diagrams
		P223.4	Design the test cases for the user specification.
		P223.5	Implement various versions of software for customization.
9	MEAN StackTechnologies (21ITITS4090)	S221.1	Develop professional web pages of an application using HTML elements like lists, navigations, tables, various form elements, embedded media which includes images, audio, video and CSS Styles.
		S221.2	Utilize JavaScript for developing interactive HTML web pages and validate form.
		S221.3	Build a basic web server using Node.js and workingwith Node Package Manager (NPM).
		S221.4	Build a web server usingExpress.js
		S221.5	Make use of Typescript to optimize JavaScript code byusing the concept of strict type checking.

SITE 18M Regulations

B. Tech- Electronics and Communication Technology

Course Outcomes for First Year First Semester Course	
Course Code: 18CMEGT1010	
Course Title: TECHNICAL ENGLISH	
CO1	Ability to understand Scientific vocabulary and use them confidently
CO2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO3	Ability to write error free simple technical passages
CO4	Knowledge of writing different writing styles
CO5	Confidence to write letters and technical reports clearly and coherently
CO6	Get inspired by achievements and values upheld by a renowned technocrat.
Course Code: 18CMMAT1020	
Course Title: ENGINEERING MATHEMATICS-I	
CO1	Solve first order differential equations.
CO2	Solve linear differential equations with constant coefficients.
CO3	Find the extreme of a function.
CO4	Solve partial differential equations
CO5	Evaluate multiple integrals
CO6	Verify vector integral theorems
Course Code: 18CMCHT1030	
Course Title: ENGINEERING CHEMISTRY	
CO1	Rationalize periodic properties like ionization potential, electro negativity and oxidation states.
CO2	Know the nature and working of various electrodes.
CO3	Analyze bulk properties and processes using thermodynamic considerations.
CO4	Synthesize organic molecules using different types of chemical reactions.
CO5	Understand the concepts of atomic and molecular orbital's.
CO6	Gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used forexciting different molecular energy levels.
Course Code: 18CMEET1040	
Course Title: BASIC ELECTRICAL ENGINEERING	
CO1	analyze DC circuits by using KCL, KVL and Network theorems
CO2	analyze AC circuits
CO3	explain the operation and compute performance of transformer
CO4	explain the construction and working of rotating electrical machines
CO5	describe DC-DC and DC-AC converters
CO6	Able to explain about types of LV switch gear and types of batteries
Course Code: 18CMEGL1050	
Course Title: ENGLISH COMMUNICATION SKILLS LAB	

CO1	acquire basic Proficiency in English by practicing the Listening Comprehension
CO2	acquire basic Proficiency in English by practicing the Pronunciation
CO3	acquire basic Proficiency in English by practicing the Dialogues
CO4	acquire basic Proficiency in English by practicing the Interpersonal Communication Skills
CO5	acquire basic Proficiency in English by practicing the Presentation Skills
CO6	acquire basic Proficiency in English by practicing the Discussions and Debates
Course Code: 18CMCHL1060	
Course Title: ENGINEERING CHEMISTRY LAB	
CO1	measure molecular properties like surface tension and viscosity
CO2	Determine chloride content of given water sample.
CO3	Synthesize a drug.
CO4	Determine rate constant as a function of time.
CO5	Determine strength of acids using conductivity meter.
CO6	Determine amount of Fe (II) using potentiometer.
Course Code:18CMEEL1070	
Course Title: BASIC ELECTRICAL ENGINEERING LAB	
CO1	Determine the time response and resonance of given RL, RC and RLC circuits
CO2	Determine the response using Superposition, Norton and Thevinins.
CO3	Determine the power, efficiency and regulation of ac machines
Course Code:18CMEEL1080	
Course Title: CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMAN RIGHTS(Non-Credit course)	
CO1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
CO2	Understand state and central policies, fundamental duties.
CO3	Understand Electoral Process, special provisions.
CO4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies.
CO5	Understand Engineering ethics and responsibilities of Engineers
CO6	Understand Engineering Integrity &Reliability
Course Outcomes for First Year Second Semester Course	
Course Code: 18CMMAT2010	
Course Title: ENGINEERING MATHEMATICS-II	
CO1	Solve system of linear equations
CO2	Find Eigen values and Eigen vectors of a matrix
CO3	Solve initial value problems by using Laplace transforms

CO4	Find the solution of algebraic/transcendental equations and also interpolate the functions.
CO5	Evaluate numerical integration and to solve ordinary differential equations by using numerical methods.
CO6	Find Fourier series of a periodic function and to determine the Fourier transform of a function
Course Code: 18ETPHT2020	
Course Title: ENGINEERING PHYSICS	
CO1	Calculate the electric field intensity and electrostatic potential for a charge distribution.
CO2	Solve the electrostatics problems in presence of dielectrics.
CO3	Calculate the magnetic field induction using the Biot- Savart's law.
CO4	Calculate the magnetic fields due to time varying electrical fields.
CO5	Derive the relation between electrical field intensity and time varying magnetic fields.
CO6	Apply Maxwell's equations to understanding the propagation of EM wave in vacuum and non-conducting medium.
Course Code: 18CMCST2030	
Course Title: PROGRAMMING FOR PROBLEM SOLVING	
CO1	Formulate algorithms, translate the min to programs and correct program errors.
CO2	Choose right control structures suitable for the problem to be solved.
CO3	Decompose reusable code in a program into functions.
CO4	Make use of arrays, pointers, structures and unions effectively.
CO5	Store and retrieve data from permanent storage.
CO6	learn file operations
Course Code: 18CMMEL2040	
Course Title: ENGINEERING GRAPHICS	
CO1	Construct Polygons using general methods, inscribe and describe polygons on circles, draw curves (parabola, ellipse and hyperbola, cycloids, involutes by general methods
CO2	Read, interpret and construct plain scales, diagonal scales and vernier scales
CO3	Draw orthographic projections of points, lines, Planes & Solids inclined to one reference plane. Students will be able to apply various concepts to solve practical problems related to engineering.
CO4	Draw sections and sectional views of Solids
CO5	Draw isometric view of lines, plane figures and simple solids. Student will be able to convert given isometric views into orthographic views. Students will be able to apply various concepts to solve practical problems related to engineering
CO6	Draw objects using draw and modify toolbars of AutoCAD
Course Code: 18ECPHL2050	
Course Title: ENGINEERING PHYSICS LABORATORY	
CO1	Determine the electrostatic field and static potentials.
CO2	Apply the Biot- Savart's case of circular coils.

CO3	Determine the self-inductance of a coil.
CO4	Measure value of a charged particle in electrical
Course Code: 18CMCSL2060	
Course Title: PROGRAMMING FOR PROBLEM SOLVING LAB	
CO1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solving problems.
CO2	Examine and analyze alternative solutions to a problem.
CO3	Design an algorithmic solution to a problem using problem decomposition and step-wise refinement.
CO4	Demonstrate conversion of iterative function store cursive and vice-versa.
CO5	Implement the concepts of arrays.
CO6	Implement the concepts of arrays.
Course Code: 18CMMEL 2070	
Course Title: WORKSHOP/MANUFACTURING PRACTICE	
CO1	Make use of basic carpentry joints to make furniture.
CO2	Fabricate mechanical engineering assemblies using fitting joints.
CO3	Produce various machine components by using foundry, black smithy, machining and plastic molding techniques.
Course Code: 18CMCHN2080	
Course Title: ENVIRONMENTAL SCIENCE(Non-Credit course)	
CO1	Know the importance of Environmental studies and the measures to be taken to overcome globalenvironmental challenges.
CO2	Understand the concept of eco system and its diversity.
CO3	Gain knowledge on natural resources.
CO4	Understand the concept of biodiversity.
CO5	Gain knowledge on environmental pollution.
CO6	Gain knowledge on environmental legislation and global treaties.
Course Outcomes for Second Year First Semester Course	
Course Code: 18CMMAT3010	
Course Title: ENGINEERING MATHEMATICS – III	
CO1	Find the function of a complex variable
CO2	Evaluate complex integration and expand functions using Taylor & Maclaurin's series
CO3	Evaluate integrals using Residues
CO4	Find the statistical parameters for discrete distributions
CO5	Find the statistical parameters for continuous distributions
CO6	Test the hypothesis
Course Code: 18ETETT3020	
Course Title: ELECTRONIC DEVICES	
CO1	Understand the basic concepts of semiconductor physics.
CO2	Understand the construction and operating principle of p-n junction diode and special semiconductordiodes

CO3	diodes as rectifiers and analyze characteristics with and without filters
CO4	Understand the construction and principle of operation of BJT and FET w.r.t V-I characteristics.
CO5	Analyze various biasing techniques for BJT and FET.
CO6	Analyze BJT and FET using small signal analysis
Course Code: 18ETETT3030	
Course Title: NETWORK THEORY	
CO1	Analyze basic electrical networks using mesh, nodal techniques.
CO2	Analyzebasicelectricalnetworksusingtopologicaldescriptionofthenetwork.
CO3	Apply and analyze various network theorems for DC and AC circuits.
CO4	Analyze the transient response of R-L, R-C and R-L-C networks
CO5	Analyze two port networks.
CO6	Analyze the characteristics of Filters and Attenuators.
Course Code: 18ETETT3040	
Course Title: SIGNALS & SYSTEMS	
CO1	Understand various signals and systems and demonstrate their properties.
CO2	Interpret Fourier analysis of continuous-time Signals.
CO3	Apply sampling theorem for signal conversion from continuous-time signals to discrete-time.
CO4	Analyze continuous time signals by using Laplace transforms
CO5	Understand various operations on LTI systems
CO6	Apply z-transform to analyze discrete-time signals and systems
Course Code: 18ETETT3050	
Course Title: PROBABILITY & STOCHASTIC PROCESSES	
CO1	Understand the axiomatic formulation of Probability Theory
CO2	Demonstrate the concept of random variable and its distribution, density functions
CO3	Apply statistical operations and transformations on 1-D random variable
CO4	Extend the concept of 1-D random variable to multiple random variables
CO5	Analyze random processes by understanding its temporal and Spectral characteristics
CO6	Analyze linear Time Invariant systems with random inputs
Course Code: 18ETETL3060	
Course Title: ELECTRONIC DEVICES LAB	
CO1	Analyze the characteristics of Semiconductor devices.
CO2	Design and verify the biasing circuit for BJT
CO3	Design and analyze BJT and FET Amplifier Circuits

Course Code:18ETETL3070	
Course Title: NETWORK THEORY LAB	
CO1	Analyze complex DC and AC linear circuits
CO2	Apply concepts of electrical circuits across engineering
CO3	Analyze the given electrical network by using PSPICE Simulation tool
Course Code:18ETETN3080	
Course Title: PULSE & DIGITAL CIRCUITS LAB(MC)	
CO1	Analyze linear wave shaping circuits with different inputs.
CO2	Design Nonlinear wave shaping circuits.
CO3	Design switching circuits.
CO4	Analyze different Multivibrators
CO5	Design different multivibrators
CO6	Understand different types of time base generators
Course Outcomes for Second Year Second Semester Course	
Course Code:18ETETT4010	
Course Title: DIGITAL SYSTEM DESIGN	
CO1	Understand the basic number systems, conversions and Boolean algebra.
CO2	Design digital systems using combinational circuits
CO3	Design digital systems using sequential circuits
CO4	Understand the concepts of logic families and corresponding logic levels
CO5	DesigndigitalsystemusingPLDsandUnderstandtheconstructionandworkingof memories
CO6	Design digital systems using VHDL
Course Code:18CMMET4020	
Course Title: ENGINEERING MECHANICS	
CO1	Able to Resolve the forces into components, moment of force and its applications
CO2	Construct free body diagrams and develop appropriate equilibrium equations
CO3	Determine Centroid and moment of inertia for composite areas.
CO4	Determine the kinematic relations of particles &rigid bodies
CO5	Apply equations of motion to particle and rigid body.
CO6	Analyze motion of particles & rigid bodies using the principle of energy and momentum
Course Code:18ETETT4030	
Course Title: ELECTRO MAGNETIC WAVES & TRANSMISSIONLINES	
CO1	Analyze wave equations in different mediums
CO2	Understand the reflection and refraction mechanism of plane waves with normal and oblique incidences
CO3	Demonstrate types of transmission lines and its fundamental characteristics

CO4	Apply the characteristics of transmission lines to analyze the impedance matching
CO5	Understand TE/TM/TEM modes of propagation in rectangular waveguides
CO6	Demonstrate the working mechanism of Micro strip and cavity resonators
Course Code:18ETETT4040	
Course Title: ANALOG CIRCUITS	
CO1	Analyze and design single and multi-stage amplifiers at low, mid and high frequencies.
CO2	Understand the concept of feedback and design different oscillator circuits.
CO3	Analyze and design different types of feedback amplifiers
CO4	Design different Power amplifiers and evaluating the efficiency
CO5	Demonstrate linear and non-linear applications of operational amplifiers
CO6	Demonstrate 555 timer applications and different Data Converters
Course Code:18ETETT4050	
Course Title: ANALOG & DIGITAL COMMUNICATIONS	
CO1	Understand the concept of modulation and amplitude modulation.
CO2	Differentiate various schemes of amplitude modulation and demodulation techniques.
CO3	Understandthefundamentalsofanglemodulationanddemodulationtechniques.
CO4	Extend the various analog modulation schemes for pulse carrier
CO5	Establish various pulse modulation schemes in digital domain
CO6	Interpret probability error for digital modulation techniques
Course Code:18ETETL4060	
Course Title: DIGITAL SYSTEM DESIGN LAB	
CO1	Design digital systems using combinational circuit's using VHDL.
CO2	Design digital systems using sequential circuit's using VHDL
CO3	Design Memories using VHDL
Course Code:18ETETL4070	
Course Title: ANALOG CIRCUITS LAB	
CO1	Design two stage amplifier and analyze frequency response at low, mid and high frequencies.
CO2	Design feedback amplifier and analyze its frequency response
CO3	Design different oscillator circuits and evaluate its frequency of oscillation
CO4	Design different Power amplifiers and evaluate the efficiency
CO5	Design linear and non-linear applications of operational amplifiers
Course Code:18ETETL4080	
Course Title: ANALOG & DIGITAL COMMUNICATIONS LAB	
CO1	Infer the modulation and demodulation techniques for continuous wave.
CO2	Apply the sampling theorem.

CO3	Analyze the modulation and demodulation techniques for pulse carrier
Course Outcomes for Third Year First Semester Course	
Course Code:18CMMST5010	
Course Title: MANAGEMENT SCIENCE	
CO1	Define the Basic Concepts of Management and organization
CO2	Summarize the Statistical Quality Control Techniques, Methods of inspection, the concept of InventoryManagement and Control
CO3	Identify the Customer Behavior and Employees Contribution towards success of Organization
CO4	Apply the techniques of project management to complete the project within the duration and cost
CO5	Identify the various types of strategies for organizational development
Course Code:18ETETT5020	
Course Title: CONTROL SYSTEMS	
CO1	Characterize a control system and Develop mathematical model of the physical systems.
CO2	Apply time response analysis on first and second order systems
CO3	Analyze the system stability using Routh Hurwitz and Root locus techniques
CO4	Analyze the system stability using frequency response analysis
CO5	Apply state variable analysis to continuous time systems and obtain the relationship between statevariable representation and transfer functions.
Course Code:18CMMST5030	
Course Title: TELECOMMUNICATIONS AND SWITCHING NETWORKS	
CO1	Students will be able to analyze different switching methodologies
CO2	Students will be able to differentiate between signaling methods used in Telecommunication Networks
CO3	Students will be able to understand queuing systems and models.
CO4	Students will exhibit a good knowledge on data communication networks and ISDN and be able to differentiate LAN, MAN, WAN
CO5	Students will demonstrate an ability to work on various Telecommunication Network concepts.
C06	Students will demonstrate knowledge on modern telecommunication concepts like DSL & SONET.
Course Code:18ETETT5040	
Course Title: MICROPROCESSORS AND MICRO CONTROLLERS	
CO1	Understand the internal operation and programming concepts of 8086 microprocessor
CO2	Apply the interfacing concepts of 8086 with memory and other peripherals.
CO3	Applying the interfacing concepts of 8086 with basic hardware components
Course Code:18ETETT5050	
Course Title: DIGITAL SIGNAL PROCESSING	
CO1	Illustrate the Discrete time signals and systems.
CO2	Apply the FFT algorithm for solving the DFT of a given signal.

CO3	Construct a Digital IIR and FIR filter for the given specifications
Course Code:18ETETP506A	
Course Title: RADIATION SYSTEMS	
CO1	Comprehend and appreciate the significance and role of this course in the present contemporary world.
CO2	Understand the fundamentals of the antenna by gaining technical knowledge regarding antenna parameters.
CO3	Have insight into the radiation phenomena.
CO4	Have a thorough understanding of the radiation characteristics of different types of Antennas.
CO5	Identify the different types of propagation of radio waves at various frequencies.
Course Code:18ECECP506B	
Course Title: DIGITAL DESIGN THROUGH VERILOG	
CO1	Understand the basics of Verilog hardware description languages.
CO2	Apply the gate level and dataflow modeling styles to all digital circuits
CO3	Construct digital circuits using behavioral modeling
CO4	Understand switch level modeling along with system tasks and functions.
CO5	Implement sequential logic design and analyze the models by learning test bench programming
CO6	Understand various architectures of commercial FPGAs.
Course Code:18ECECP506C	
Course Title: IOT FUNDEMENTALS	
CO1	Understand internet of Things and its hardware and software components.
CO2	Understand ARM &Interface I/O devices, sensors &communication modules.
CO3	Understand IOT application development and various protocols.
CO4	Explain smart connectivity and low energy issues
CO5	Understand solution framework for IOT applications and remotely monitor data and control devices.
CO6	Design real time IOT based applications and performs mini projects.
Course Code:18ECECP506D	
Course Title: SPREAD SPECTRUM TECHNIQUES	
CO1	Understand Spread spectrum techniques and various codes used in SST.
CO2	Explain code tracking loops and significance
CO3	Explain the concept of Synchronization of the receiver Spreading Code
CO4	Explain the Synchronization of Received Spreading Code.
CO5	Understand the Interference Combat Detection Schemes, Interference Cancellation Techniques.
CO6	Analyze the performance of Spread spectrum systems in Jamming environment and systems with Forward Error Correction.
Course Code:18ETETL5070	
Course Title: MICROPROCESSORS AND MICROCONTROLLERS LAB	
CO1	Perform the Arithmetic and logic operations with 8086 processors.
CO2	Learn the various interfacing concepts with 8086 processors
CO3	Design a real time clock with modern microcontroller boards
CO4	Learn the various interfacing mechanisms with modern microcontroller boards.

CO5	Compile, design and test a simple microcontroller based system with their programming models .
Course Code:18ETETL5080	
Course Title: DIGITAL SIGNAL PROCESSING LAB	
CO1	Illustrate the fundamental discrete time signals
CO2	Experiment with the properties of an LTI system
CO3	Construct a Digital IIR filter for the given specifications
CO4	Construct a Digital FIR filter for the given specifications
CO5	Apply basic building blocks of Multi-rate signal processing
Course Code:18CMAHS5090	
Course Title: Skill Oriented Course-I (SOFT SKILLS & APTITUDE BUILDER – 1)	
CO1	re-engineer attitude and understand its influence on behaviour
CO2	develop interpersonal skills and be an effective goal oriented team player
CO3	develop holistic personality with a mature outlook to function effectively in different circumstances
CO4	solve the real-time problems for performing job functions easily
CO5	Analyze the problems logically and critically
Course Code:18CMMSN50A0	
Course Title: BIOLOGY FOR ENGINEERS	
CO1	Able to describe how biological observations of 18th Century that lead to major discoveries.
CO2	Able to convey that classification per se is not what biology is all about but highlight the underlyingcriteria, such as morphological, biochemical and ecological
CO3	Able to demonstrate the highlight the concepts of recessiveness and dominance during the passage ofgenetic material from parent to offspring.
CO4	Able to convey that all forms of life have the same building blocks and yet the manifestations are asdiverse as one can imagine.
CO5	Able to classify enzymes and distinguish between different mechanisms of enzyme action.
Course Outcomes for Third Year Second Semester Course	
Course Code:18ETETT6010	
Course Title: Engineering Economics and Financial Management	
CO1	Students are equipped with the knowledge of managerial economics and estimating demand for a product.
CO2	Students understand Production and Cost concepts, estimating Cost Break even Analysis.
CO3	Students are equipped with the knowledge on Markets and Pricing methods along with Business Cycles.
CO4	Students are able to understand Accounting Concepts and Prepare Financial Statements- Analysis
CO5	Students are able to analyze various investment project proposals with the help of Capital Budgeting techniques.
Course Code:18ETETT6020	
Course Title: VLSI DESIGN	
CO1	Understand the introduction and basic electrical properties of MOS and BiCMOS circuits.
CO2	Understand the intricacies of VLSI Circuit design processes.

CO3	Analyze the parametric for CMOS Circuits
CO4	Analysis of VLSI design methodologies
CO5	Understand design for Manufacturability and Testability
Course Code:18CMMST6030	
Course Title: COMPUTER NETWORKS	
CO1	Summarize different type reference models, topologies and networks and functions of physical layer
CO2	Analyze various data link layer protocols
CO3	Demonstrate about different Routing Algorithms in Computer Networks
CO4	Analyze transport layer services and protocols
CO5	Interpret network security and computer network applications
Course Code:18ETETP604A	
Course Title: MICRO WAVE AND OPTICAL COMMUNICATIONS	
CO1	Known power generation at microwave frequencies and derive the performance characteristics.
CO2	Realize the need for solid state microwave sources and understand the principles of solid state devices.
CO3	Distinguish between the different types of waveguide and ferrite components, and select proper components for engineering applications.
CO4	Understand the utility of S-parameters in microwave components.
CO5	Design and learn the measurement procedure of various microwave parameters.
Course Code: 18ETETP604B	
Course Title: DESIGN OF FAULT TOLERANT SYSTEMS	
CO1	To acquire the knowledge of fundamental concepts in fault tolerant design.
CO2	Design requirements of self check-in circuits.
CO3	Test pattern generation using LFSR
CO4	Design for testability rules and techniques for combinational circuits.
CO5	Introducing scan architectures.
Course Code:18ETETP604C	
Course Title: EMBEDDED SYSTEM DESIGN	
CO1	Understand the fundamentals of the embedded systems.
CO2	Know the hardware details of the embedded systems.
CO3	Learn concept of firmware design approaches, Interrupt concept.
CO4	Learn about the various embedded software development tools
CO5	Understand the embedded system design life cycle and co-design issues
Course Code:18ETETP604D	
Course Title: DIGITAL IMAGE AND VIDEO PROCESSING	
CO1	Perform the basic operations on images and can compute different image transforms.

CO2	Perform image enhancement in spatial and frequency domain, be able to restore the givendegraded image.
CO3	Segment and compress the given image using different techniques.
CO4	Perform different morphological operations on images and image color inter conversions.
CO5	Differentiate analog and digital video, perform sampling and filtering of video signals usingdifferent models.
CO6	Understand optical flow and different motion estimation models.
Course Code:18ETETL6070	
Course Title: COMPUTER NETWORKS LAB	
CO1	Construct the stack, Queue and their applications using Arrays.
CO2	Apply Linked list concepts to implement the stack, Queue and their applications.
CO3	Develop different framing methods and error control mechanisms of Data link layer
CO4	Develop routing algorithms of Network layer
CO5	Construct transport layer applications
Course Code:18ETETL6080	
Course Title: VLSI DESIGN LAB	
CO1	Design CMOS logic circuits.
CO2	Design and simulation of Combinational and Sequential CMOS
CO3	Generation and verification of layouts for combinational CMOS Circuits.
CO4	Generation and verification of layouts for sequential CMOS Circuits
CO5	Design and analysis of DRC and LVS for CMOS
Course Code:18CMAHS6090	
Course Title: SOFT SKILLS & APTITUDE BUILDER – 2	
CO1	learn and practice effective communication skills
CO2	develop broad career plans, evaluate the employment market, and become industry ready
CO3	develop accuracy on time and distance and units related solutions
CO4	solve the real-time problems for performing job functions easily
CO5	solve problems related to permutations and combinations, probability, areas and volumes
Course Outcomes for Fourth Year First Semester Course	
Course Code:18ETETT7010	
Course Title: RF SYSTEM DESIGN	
CO1	To acquire the importance of RF Issues and various considerations for design
CO2	To understand the filter design in RF range
CO3	To understand the active components and applications
CO4	To design RF Amplifiers
CO5	To analyze the characteristics of RF Amplifiers
Course Code: 18ETETT702A	

Course Title: RADAR & SATELLITE COMMUNICATIONS	
CO1	Analyze the RADAR equation and required parameters
CO2	Understand various RADAR technologies and concept of radar tracking.
CO3	Learn the communication satellite mechanics and keplers laws.
CO4	Analyze various orbital parameters and orbital effects.
CO5	Explain AOCS and various types of access techniques.
C06	Analyze satellite link design and calculate C/N
Course Code:18ETETP702B	
Course Title: LOW POWER VLSI DESIGN	
CO1	Understand fundamental concepts in low power CMOS VLSI design.
CO2	Design Basic cells with low power
CO3	Realize the applications in low power design
CO4	Understand the applications and developments in low power low voltage ROM
CO5	Understand the design of low power low voltage RAM.
Course Code:18ETETP702C	
Course Title: SYSTEM ON CHIP ARCHITECTURES	
CO1	Able to understand and design methodologies for SOC
CO2	Able to understand On chip Communication Architecture Standards
CO3	Able to analyze security issues of On chip Communication Architecture standards
CO4	Able to understand and analyze different Topologies of Networks on Chip.
CO5	Verification of on chip communication protocols, compliance verification and analyze security issues of On chip Communication
Course Code:18ETETP702D	
Course Title: BIO-MEDICAL SIGNAL PROCESSING	
CO1	Understand the need of biomedical signals
CO2	Describe the Detection of biomedical signals in noise
CO3	Understand ECG, ECG parameters estimation
CO4	Analyze the Spectral analysis of heart rate variability - interaction with other physiological signals
CO5	Understand the categorization of EEG activity - recording techniques - EEG applications
CO6	Analyze the stochastic models – Non-linear modeling of EEG
Course Code:18ETETP703A	
Course Title: SOFTWARE DEFINED RADIO	
CO1	Understand the applications of software radio
CO2	Design filters used in multirate signal processing
CO3	Generate synthesized signals
CO4	Analyze the requirements for design of smart antennas
CO5	Understand the design of software radio and motivated towards cognitive radio application

Course Code:18ETETP703B	
Course Title: CPLD AND FPGA ARCHITECTURES AND APPLICATIONS	
CO1	Understand the concept of PLDs
CO2	Explain the architectures of FPGAs and its operation.
CO3	Gain the knowledge on SRAM programming for FPGAs.
CO4	Design the programmed FPGA using programming technology for various applications.
CO5	Design adders and accumulators with ACT devices.
Course Code:18ETETP703C	
Course Title: WIRELESS TECHNOLOGIES FOR IOT	
CO1	Remember and understand Radio Frequency (RF)Fundamentals
CO2	Understand the Factors affecting network range
CO3	Illustrate the various cellular standards
CO4	Understand the different wireless technologies
CO5	Understand the basics of embedded wireless application development
C06	Remember and understand Wireless Personal Area Networks
Course Code:18ETETP703D	
Course Title: ARTIFICIAL NUERAL NETWORKS	
CO1	Demonstrate ANN structure and activation Functions
CO2	Define foundations and learning mechanisms and state-space concepts
CO3	Identify structure and learning of perceptions
CO4	Explain Feed forward, multi-layer feed forward networks and Back propagation algorithms
CO5	Analyze Radial Basis Function Networks, Theor Regularization and RBF networks
Course Code:18ETETP704A	
Course Title: GLOBAL POSITIONING SYSTEMS	
CO1	Explain about fundamental blocks of global positioning system
CO2	signal characteristics of GPS are analyzed
CO3	Explore to the GPS Design analysis.
CO4	Illustrate about differential GPS
CO5	Explain and trained towards applications of GPS
Course Code:18ETETP704B	
Course Title: CAD TOOLS FOR VLSI	
CO1	Explain VLSI design methodologies and supporting CAD environment
CO2	Understand the Plotting Layout, Layout Editor
CO3	Analyze the Placement & routing, Floor planning

CO4	Understand Simulation techniques for various design circuits
CO5	Explain Optimization Algorithms for the design circuits
C06	Analyze the Computational complexity issues in testing the circuits
Course Code:18ETETP704C	
Course Title: BIG ANALYTICS FOR IOT	
CO1	Describe the Big Data Platforms for the Internet of Things
CO2	Understand RFID False Authentication
CO3	Acquire the knowledge of FOG computing
CO4	Understand Toward Web Enhanced Building Automation Systems
CO5	Understand Sustainability Data and Analytics in Cloud-Based M2M Systems
CO6	Describe Building a useful understanding of a social network
Course Code:18ETETP704D	
Course Title: FUZZY LOGIC SYSTEMS	
CO1	Understand Fuzzy Logic systems
CO2	Describe properties of classical set and fuzzy sets
CO3	Understand Fuzzy relations and aggregations –I
CO4	Understand Fuzzy relations and aggregations –II
CO5	Understand Fuzzy optimization
CO6	Describe the applications of fuzzy logic
Course Code:18ETETS7090	
Course Title: IMAGE PROCESSING WITH OPEN CV	
CO1	Understand Open CV , structure and content
CO2	Demonstrate Open CV data types, operators, performance primitives
CO3	Understand OpenCV high GUI
CO4	Understand Threshold versus adaptive threshold Compare thresholding with adaptive thresholding
CO5	Understand various types of Image transforms and analyze
CO6	Understand histogram, Image Parts and Segmentation.
Course Code:18ETETS7090	
Course Title: ELECTROMAGNETICS SIMULATION TOOLS(HFSS, CST & FEKO)	
CO1	Understand Electromagnetic simulation tools and HFSS
CO2	Demonstrate working with geometries, drawing models, assigning materials, assigning boundaries, creating the ports, Creating solution setup
CO3	Analyze optimization, post processing and parameter evaluation
CO4	Design of Antennas with HFSS
CO5	Design of probe fed micro strip antenna, Design of Triangular antenna, Design of slot antenna

CO6	Design of Microwave Communication Modules
Course Code: 18ETETN70A0	
Course Title: ELECTRONICS MEASUREMENTS AND INSTRUMENTATION	
CO1	Understand the performance characteristic of instruments
CO2	Understand the functional characteristics of voltmeter and ammeter
CO3	Understand signal generator's features
CO4	Analyze the variants of AC Bridges
CO5	Understand the features and functionalities of transducers

SITE 21

B. Tech- (Electronics and Communication Technology)

Course Outcomes for First Year First Semester Course	
Course Code: 21CMMAT1010	
Course Title: ENGINEERING MATHEMATICS-I	
CO-1	Solve the differential equations related to various engineering fields (L3)
CO-2	Solve the differential equations of higher order related to various engineeringfields (L3)
CO-3	familiarize with functions of several variables which is useful in optimization(L3)
CO-4	Solve the partial partial differential equations of first order (L3)
CO-5	Apply double integration techniques in evaluating areas bounded by region (L3).
Course Code: 21ETPHT1020	
Course Title: ENGINEERING PHYSICS	
CO-1	Formulate the electric field and electric potential using fundamental laws inelectrostatics.
CO-2	Understand the microscopic behavior of dielectrics in electrical field.
CO-3	Calculate the static magnetic fields due to current carrying conductors.
CO-4	Estimate the physical parameters of a system using the basic laws of electricityand magnetism.
CO-5	Recognize the relation between electrical fields and time varying magnetic fields
Course Code: 21CMCHT1030	
Course Title: ENGINEERING CHEMISTRY	
CO-1	Interpret the mechanism of corrosion
CO-2	Summarize the problems faced in industries due to boiler troubles.
CO-3	Recall the properties and applications of advanced materials.
CO-4	Summarize the advantages of non-conventional energy resources and batteries.
CO-5	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used for exciting different molecular energy levels.
Course Code: 21CMCST1040	
Course Title: PROGRAMMING FOR PROBLEM SOLVING	
CO-1	Demonstrate computer components, algorithms, translate them into programs.
CO-2	Choose the suitable control structures for the problem to be solved.
CO-3	Make use of arrays, pointers, structures, and unions effectively.
CO-4	Organize reusable code in a program into functions.
CO-5	Demonstration of file operations.
Course Code: 21ETMEL1050	
Course Title: COMPUTER AIDED ENGINEERING GRAPHICS	
CO-1	understand the BIS conventions of engineering drawing with basic concepts & draw engineering objects with appropriate lettering and dimensioning usingvarious commands of AutoCAD

CO-2	construct polygons, various types of Curves and scales used engineering application like maps, buildings, bridges
CO-3	draw multi views of points, lines and planes by orthographic projection method
CO-4	draw multi views of solids by orthographic projection method
CO-5	convert the orthographic views into isometric views and vice versa by 2D-Commands in AutoCAD
Course Code: 21ETPHL1060	
Course Title: ENGINEERING PHYSICS LAB	
CO-1	Compare the theory and correlated with experiments
CO-2	Design experiments
CO-3	Analyze the experimental result
CO-4	Apply appropriate techniques to perform the experiments
CO-5	Apply the fundamental laws in electromagnetism to understand the behavior ofelectromagnetic fields.
Course Code: 21CMCHL1070	
Course Title: ENGINEERING CHEMISTRY LABORATORY	
CO-1	Able to measure molecular properties like surface tension and viscosity
CO-2	Able to determine chloride content of given water sample
CO-3	Able to synthesize a drug.
CO-4	Able to determine rate constant as a function of time
CO-5	Able to determine strength of acids using conductivity meter
Course Code: 21CMCSL1080	
Course Title: PROGRAMMING FOR PROBLEM SOLVING LAB	
CO-1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solvingproblems
CO-2	Examine and analyze alternative solutions to a problem
CO-3	Design an algorithmic solution to a problem using problem decomposition andstep-wise refinement.
CO-4	Demonstrate conversion of iterative functions to recursive and vice-versa
CO-5	Implement the concepts of arrays
Course Code: 21CMMSN2090	
Course Title: CONSTITUTION OF INDIA, PROFESSIONAL ETHICS & HUMANRIGHTS	
CO-1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
CO-2	Understand state and central policies, fundamental duties.
CO-3	Understand Electoral Process, special provisions.
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operativeSocieties, and
CO-5	Understand Engineering ethics and responsibilities of Engineers
Course Outcomes for First Year Second Semester Course	

Course Code: 21CMEGT2010	
Course Title: TECHNICAL ENGLISH	
CO-1	Ability to understand Scientific vocabulary and use them confidently
CO-2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO-3	Ability to write error free simple technical passages
CO-4	Knowledge of writing different writing styles
CO-5	Confidence to write letters and technical reports clearly and coherently
Course Code: 21CMMAT2020	
Course Title: ENGINEERING MATHEMATICS-II	
CO-1	Develop the use of matrix algebra techniques that is needed by engineers forpractical applications and solve system of linear equations (L6)
CO-2	Find the inverse and power of a matrix by Cayley-Hamilton theorem and reducethe Quadratic form (L3)
CO-3	Solve initial value problems by using Laplace transforms (L3)
CO-4	Find the solution of algebraic/ transcendental equations and also interpolate the functions(L3)
CO-5	Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (L3).
Course Code: 21CMEET2030	
Course Title: BASIC ELECTRICAL ENGINEERING	
CO-1	Understand basic electrical circuit operation.
CO-2	Understand the concept of Alternating Voltage and Current.
CO-3	Understand the operation of DC machines.
CO-4	Understand the working of measuring instruments.
CO-5	Understand the operation of different types of ac machines.
Course Code: 21CMCST2040	
Course Title: PYTHON PROGRAMMING	
CO-1	Able to learn the fundamental concepts in the Python language
CO-2	Implementation of python iterative statements and strings
CO-3	Demonstrate python lists, dictionaries and functions
CO-4	Understand the concepts of modules and packages in python
CO-5	Complete coding challenges relating to object-oriented programming's essential concepts and techniques.
Course Code: 21ETETT2050	
Course Title: NETWORK ANALYSIS	
CO-1	Gain the knowledge on basic network elements.
CO-2	Will analyze the RLC circuits' behavior in detailed.
CO-3	Analyze the performance of periodic waveforms.
CO-4	Gain the knowledge in characteristics of two port network parameters(Z,Y,ABCD,h&g).

CO-5	Analyze the filter design concepts in real world applications
Course Code: 21CMEGL2060	
Course Title: ENGLISH COMMUNICATION SKILLS LAB	
CO-1	Acquire basic proficiency in english by practicing the listening comprehension
CO-2	Acquire basic proficiency in english by practicing the pronunciation
CO-3	Acquire basic proficiency in english by practicing the dialogues
CO-4	Acquire basic proficiency in english by practicing the interpersonalcommunication skills
CO-5	Acquire basic proficiency in english by practicing the presentation skills
Course Code: 21CMEEL2070	
Course Title: BASIC ELECTRICAL ENGINEERING LABORATORY	
CO-1	Verify the Kirchoff's laws.
CO-2	Verify network theorems for a given circuit.
CO-3	Control the speed of DC motor.
CO-4	Analyze performance of single phase induction motor
CO-5	Analyze performance of three phase induction motor.
Course Code: 21ETMEL2080	
Course Title: ENGINEERING WORKSHOP LAB	
CO-1	Perform the joinery work of wooden pieces using carpentry.
CO-2	Perform the joinery work of metallic pieces using fitting.
CO-3	Produce the required shaped metallic products using black smithy.
CO-4	Make the green sand moulds using different patterns
CO-5	Fabricate different components using welding.
Course Code: 21CMCHN2090	
Course Title: ENVIRONMENTAL SCIENCE	
CO-1	Obtain knowledge on global warming & climate change - Acid rains, ozone layerdepletion.
CO-2	Preserve several natural resources
CO-3	Summarize the concept of ecosystem
CO-4	Control different types of pollution
CO-5	Understand social issues and environmental legislation
Course Outcomes for Second Year First Semester Course	
Course Code: 21ETMAT3010	
Course Title: ENGINEERING MATHEMATICS-III	
CO-1	Interpret the physical meaning of different operators such as gradient, curl anddivergence(L5)
CO-2	Estimate the work done against a field, and verify integral theorems (L5)
CO-3	apply Cauchy-Riemann equations to complex functions in order to determinewhether a given continuous function is analytic (L3)
CO-4	find the differentiation and integration of complex functions used in engineering problems(L3)

CO-5	make use of the Cauchy residue theorem to evaluate certain integrals (L3)
Course Code: 21ETETT3020	
Course Title: PROBABILITY THEORY & STOCHASTIC PROCESSES	
CO-1	Understand the concepts of Probability Theory and Random Variables.
CO-2	Apply statistical operations and transformations on one Random Variable.
CO-3	Extend the concept of one random variable to multiple random variables andApply statistical operations and transformations on multiple Random Variables.
CO-4	Characterize the random processes in the time domain.
CO-5	Characterize the random processes in the frequency domain and analyze the LTIsystems with random inputs.
Course Code: 21ETETT3030	
Course Title: SEMICONDCUTOR DEVICES	
CO-1	Understand the basic concepts of semiconductor physics.
CO-2	Understand the working of different types of diodes.
CO-3	Understand the construction, principle of operation and V-I characteristicsofvarious Transistors.
CO-4	Know the construction, working principle of rectifiers with and without filters.
CO-5	Know the need of transistor biasing and various biasing techniques for BJT and FET
Course Code: 21ETETT3040	
Course Title: DIGITAL SYSTEM DESIGN	
CO-1	Understand the basic number systems and conversions.
CO-2	Apply the Boolean algebra to optimize the logic functions using K-maps and to understand the basic concepts of VHDL.
CO-3	To design and analyze combinational logic circuits, PLDs
CO-4	To design and analyze sequential logic circuits.
CO-5	To design combinational and sequential logic circuits using mealy and moremachines using VHDL and to understand various logic families
Course Code: 21ETETT3050	
Course Title: SIGNALS & SYSTEMS	
CO-1	Illustrate various signals and systems and their properties.
CO-2	Make use of Fourier analysis for frequency domain representation of signals
CO-3	Solve the response of LTI system through Convolution and Correlation.
CO-4	Construct Sampling theorem for signal conversion.
CO-5	Apply Z-Transform for the analysis of discrete-time signals.
Course Code: 21ETETL3060	
Course Title: SEMICONDUCTOR DEVICES LAB	
CO-1	Identify different components and know the operation of multimeter, function generator, regulated power supply and CRO
CO-2	Analyze the characteristics of Semiconductor diodes

CO-3	Analyze the working of rectifier circuits with and without filters
CO-4	Analyze V-I characteristics of transistor and construct various biasing circuits
CO-5	Construct Printed Circuit Board (PCB) for the given electronic circuits.
Course Code: 21ETETL3070	
Course Title: DIGITAL SYSTEM DESIGN LAB	
CO-1	Design of Logic Gates and code converters
CO-2	Design and analysis of basic arithmetic logic circuits.
CO-3	Design and analysis of combinational logic circuits
CO-4	Design and analysis of Sequential logic circuits
CO-5	Design of complex logic circuits using Finite State Machines
Course Code: 21ETETL3080	
Course Title: ELECTRICAL CIRCUITS LAB	
CO-1	To analyze basic Electrical circuits by Applying KVL & KCL
CO-2	To verify electrical circuits using Thevenin's and Norton's theorems
CO-3	To verify transient response of RL, RC, and RLC electrical circuits
CO-4	To analyze electrical networks using network parameters
CO-5	To verify characteristics of low-pass and high-pass filters
Course Code: 21ETETS3090	
Course Title: DATA SCIENCE USING PYTHON	
CO-1	Perform various operations on numpy arrays.
CO-2	Importing data from different file formats using pandas.
CO-3	Draw different types of charts using matplotlib
Course Code: 21ECECS3090	
Course Title: MATLAB FOR ENGINEERS	
CO-1	Understand MATLAB environment, variables and arrays
CO-2	Understand MATLAB Functions includes user defined and built-in functions
CO-3	Use graphics, 2D, 3D Plotting and handling graphics
CO-4	Programme using MATLAB – conditional statements, programming and Debugging, applications.
CO-5	Understand mathematical computing with MATLAB
Course Outcomes for Second Year Second Semester Course	
Course Code: 21CMMST4010	
Course Title: MANAGEMENT SCIENCE	
CO-1	Execute the functions of Management, Principles of Management & Leadershipstyles.
CO-2	Examine Statistical Quality Control Techniques, Methods of inspection, the concept of Inventory Management and Control
CO-3	Identify different Strategies for the Development of the Organization.
CO-4	Analyze Project Management Techniques like CPM, PERT and Crashing.

CO-5	Apply various contemporary issues in Management Practices like TQM, BusinessProcess Reengineering and BPO etc
Course Code: 21ETETT4020	
Course Title: ELECTROMAGNETIC WAVES AND TRANSMISSION LINES	
CO-1	Demonstrate knowledge and understanding of fundamental electromagnetic lawsand concepts
CO-2	Understand the EM wave propagation in a medium and through boundaries
CO-3	Analyze the various types of transmission lines and to discuss the losses associated.
CO-4	Comprehend the working of transmission line at radio frequencies
CO-5	Analyze the problems in RF line and stub matching using Smith chart
Course Code: 21ETETT4030	
Course Title: PRINCIPLES OF COMMUNICATION THEORY	
CO-1	Understand the concept of modulation and amplitude modulation.
CO-2	Differentiate various schemes of amplitude modulation and demodulationtechniques.
CO-3	Understand the fundamentals of angle modulation and demodulation techniques.
CO-4	Analyze noise characteristics of various analog modulation methods.
CO-5	Analyze the concepts of pulse modulation schemes.
Course Code: 21ETETT4040	
Course Title: ELECTRONIC CIRCUIT ANALYSIS	
CO-1	Perform the analysis of small signal amplifier circuits using BJT and FET
CO-2	Design small signal high frequency amplifiers and estimate the effects ofcascading
CO-3	Design different types of feedback amplifier and oscillator circuits
CO-4	Design a power amplifier with the required efficiency
CO-5	Design the tuned amplifiers and the effect of cascading
Course Code: 21ETETT4050	
Course Title: CONTROL SYSTEMS	
CO-1	Characterize a control system and effects of feedback
CO-2	Apply time response analysis on first and second order systems
CO-3	Analyze the system stability using Routh Hurwitz and Root locus techniques
CO-4	Analyze the system stability using frequency response analysis
CO-5	Apply state variable analysis to continuous time systems and obtain therelationship between state variable representation and transfer functions
Course Code: 21ETETL4060	
Course Title: PRINCIPLES OF COMMUNICATION LAB	
CO-1	Infer the modulation and demodulation techniques for continuous wave.
CO-2	Understand the operation of demodulation techniques
CO-3	Illustrate the significance of the sampling theorem.
CO-4	Analyze various pulse modulation and demodulation techniques

CO-5	Analyze and simulate communication link
Course Code: 21ETETL4070	
Course Title: ELECTRONIC CIRCUIT ANALYSIS LAB	
CO-1	Design CE amplifier and analyze frequency response at low, mid and highfrequencies
CO-2	Design two stage amplifier and analyze frequency response at low, mid and highfrequencies
CO-3	Design feedback amplifiers and oscillator circuits to analyze its frequency response
CO-4	Design different Power amplifiers and evaluate the efficiency
CO-5	Design tuned amplifier and evaluate the resonant frequency
Course Code: 21ETETL4080	
Course Title: SIGNALS AND SYSTEMS LAB	
CO-1	Experiment with Generation of fundamental signals.
CO-2	Analyze the fundamental signals in frequency domain.
CO-3	Inspect the system properties for a LTI system
CO-4	Construct the Sampling theorem.
CO-5	Construct Random signals and compute various parameters related to randomsignals
Course Code: 21ETETS4090	
Course Title: Internet of Things	
CO-1	Understand the concepts of Arduino Uno and different types of I/O Devices.
CO-2	Construct interfacing circuits for different applications.
CO-3	Develop embedded C codes for different applications Arduino.
CO-4	Develop real time applications using Arduino.
Course Code: 21ETETS4090	
Course Title: PCB Designing	
CO-1	Determine appropriate components to make circuits.
CO-2	Interpret test results and measurements on electric circuits.
CO-3	Analyze the fabrication processes of Printed Circuit Boards.
CO-4	Apply the software and hardware for PCB design.
CO-5	Evaluate an electronic printed circuit board for a specific application usingindustry standard software.
Course Code: 21ETETN40A0	
Course Title: PULSE & DIGITAL CIRCUITS	
CO-1	Analyze linear wave shaping circuits with different inputs.
CO-2	Design Nonlinear wave shaping circuits.
CO-3	Design switching circuits.
CO-4	Design different multivibrators
CO-5	Understand different types of time base generators

SITE21 Regulations

B.Tech.- Artificial Intelligence & Machine Learning

Course Outcomes for First Year First Semester	
Course Code: 21CMMAT1010	
Course Title: ENGINEERING MATHEMATICS-I	
CO-1	To Solve the differential equations related to various engineering fields
CO-2	To solve the differential equations of higher order related to various engineering
CO-3	To familiarize with functions of several variables which is useful in optimization
CO-4	To Solve the partial partial differential equations of first order
CO-5	To Apply double integration techniques in evaluating areas bounded by region
Course Code: 21AMPHT1020	
Course Title: Engineering Physics	
CO-1	To Understand the theoretical view of electrical conductivity in metals using free electron theory and quantum mechanics.
CO-2	To Estimate the statistical calculation and the theoretical view of charge carrier's density in semiconductors.
CO-3	To generalization of the light-matter interaction mechanisms.
CO-4	To describe the basic laser physics and working of lasers.
CO-5	To illustrate the construction and working function of LEDs.
CO-6	To analyze the construction and working of photo diodes and solar cells.
Course Code: 21CMCHT1030	
Course Title: Engineering Chemistry	
CO-1	Interpret the mechanism of corrosion
CO-2	Summarize the problems faced in industries due to boiler troubles.
CO-3	Recall the properties and applications of advanced materials.
CO-4	Summarize the advantages of non-conventional energy resources and batteries.
CO-5	Able to gain knowledge on spectroscopic techniques and the ranges of the electromagnetic spectrum used for exciting different molecular energy levels.
CO-6	Determine the strength of acid, base and some elements by volumetric and instrumental analysis.
Course Code: 21CMCST1040	
Course Title: Programming for Problem Solving	
CO-1	Demonstrate computer components, algorithms, translate them into programs.
CO-2	Choose the suitable control structures for the problem to besolved.
CO-3	Make use of arrays, pointers, structures, and unions effectively.
CO-4	Organize reusable code in a program into functions.
CO-5	Demonstration of file operations.

Course Code: 21AMMEL1050	
Course Title: Computer Aided Engineering Graphics	
CO-1	To understand the BIS conventions of engineering drawing with basic concepts & draw engineering objects with appropriate lettering and dimensioning using various commands of AutoCAD
CO-2	Construct polygons, various types of Curves and scales used engineering Application like maps, buildings, bridges
CO-3	Draw multi views of points, lines and planes by orthographic projection method
CO-4	Draw multi views of solids by orthographic projection method
CO-5	Convert the orthographic views into isometric views and vice versa by 2D- Commands in Autocad
Course Code: 21AMPHL1060	
Course Title: Engineering Physics Lab	
CO-1	Compare the theory and correlated with experiments.
CO-2	Design experiments.
CO-3	Analyze the experimental result.
CO-4	Apply appropriate techniques to perform the experiments.
CO-5	Understand the interaction of the light with semiconductor.
Course Code: 21CMCHL1070	
Course Title: Engineering Chemistry Lab	
CO-1	To determine of alkalinity of a sample containing Na2CO3 and NaOH
CO-2	To determine of viscosity of a liquid by Ostwald viscometer
CO-3	To determine of the rate constant of first order reaction
CO-4	To determine of Ferrous iron using potentiometer.
CO-5	To determine of Fe+3by a colorimetric method.
Course Code: 21CMCSL1080	
Course Title: Programming for Problem Solving Lab	
CO-1	Attain knowledge on using CODE BLOCKS and RAPTOR tools in solving problems.
CO-2	Examine and analyze alternative solutions to a problem.
CO-3	Design an algorithmic solution to a problem using problem decomposition and step- wise refinement.
CO-4	Demonstrate conversion of iterative functions to recursive and vice-versa.
CO-5	Implement the concepts of arrays, structures, Unions and files.
Course Code: 21CMMSN1090	
Course Title: Constitution of India, Professional Ethics & Human Rights	
CO-1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
CO-2	Understand state and central policies, fundamental duties.
CO-3	Understand Electoral Process, special provisions.
CO-4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, and

CO-5	Understand Engineering ethics and responsibilities of Engineers
CO-6	Understand Engineering Integrity & Reliability
Course Outcomes for First Year Second Semester Course	
Course Code: 21CMEGT2010	
Course Title: Technical English	
CO-1	Ability to understand Scientific vocabulary and use them confidently
CO-2	Familiarity with the basic principles of writing clear sentences and paragraphs
CO-3	Ability to write error free simple technical passages
CO-4	Knowledge of writing different writing styles
CO-5	Confidence to write letters and technical reports clearly and coherently
Course Code: 21CMMAT2020	
Course Title: Engineering Mathematics - II	
CO-1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications and solve system of linear equations
CO-2	Find the inverse and power of a matrix by Cayley-Hamilton theorem and reduce the Quadratic form
CO-3	Solve initial value problems by using Laplace transforms
CO-4	Find the solution of algebraic/ transcendental equations and also interpolate the functions
CO-5	Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations
Course Code: 21CMEET2030	
Course Title: Basic Electrical Engineering	
CO-1	Understand basic electrical circuit operation.
CO-2	Understand the concept of Alternating Voltage and Current.
CO-3	Understand the operation of DC machines.
CO-4	Understand the working of measuring instruments.
CO-5	Understand the operation of different types of ac machines.
CO-6	Understand the concept of Electrical Safety.
Course Code: 21CMCST2040	
Course Title: Python Programming	
CO-1	Explain the fundamental concepts in the Python language.
CO-2	Implementation of python iterative statements and strings.
CO-3	Demonstrate python lists, dictionaries, and functions.
CO-4	Understand the concepts of modules and packages in python.
CO-5	Complete coding challenges related to object-oriented programming.
CO-6	Apply variety of error handling and GUI programming techniques.
Course Code: 21AMAMT2050	

Course Title: Data Structures	
CO-1	Discuss the Basics of data structures and computational efficiency of algorithms for sorting & searching.
CO-2	Illustration of linked lists and its operations.
CO-3	Design programs using a variety of data structures such as stacks and queues.
CO-4	Demonstrate different tree traversing method.
CO-5	Describing the graphs concepts.
Course Code: 21CMEGL2060	
Course Title: English Communication Skills Lab	
CO-1	Listening Comprehension
CO-2	Pronunciation
CO-3	Dialogues
CO-4	Interpersonal Communication Skills
CO-5	Presentations
Course Code: 21CMEEL2070	
Course Title: Basic Electrical Engineering Lab	
CO-1	Verify the Kirchoff's laws.
CO-2	Verify network theorems for a given circuit.
CO-3	Control the speed of DC motor.
CO-4	Analyze performance of single-phase induction motor
CO-5	Analyze performance of three phase induction motor.
CO-6	Identify different types of earthings
Course Code: 21AMAML2080	
Course Title: DS Lab	
CO-1	Making use of basic data structures such as arrays and linked list to solve problems.
CO-2	Demonstrate fundamental algorithmic problems including Tree Traversals, Graph traversals, and shortest paths.
CO-3	Solve various searching and sorting problems.
Course Code: 21CMCHN2090	
Course Title: Environmental Science	
CO-1	Obtain knowledge on global warming & climate change - Acid rains, ozone layer depletion.
CO-2	Preserve several natural resources
CO-3	Summarize the concept of ecosystem
CO-4	Control different types of pollution
CO-5	Understand social issues and environmental legislation
Course Outcomes for Second Year First Semester Course	

Course Code: 21AMMAT3010	
Course Title: Probability and statistics	
CO-1	Understand the concepts of data science and fit a best suitable curve for the givendata.
CO-2	Identify the random variable as discrete/continuous and analyze it.
CO-3	Predict the discrete distribution suitable for the given data from its moments.
CO-4	Predict the continuous distribution suitable for the given data from its moments
CO-5	Decide the test applicable for giving inference about Population Parameter based on Sample statistic.
Course Code: 21AMAMT3020	
Course Title: Foundations of Artificial Intelligence	
CO-1	Enumerate the history and foundations of Artificial Intelligence.
CO-2	Understand and implement different search strategies
CO-3	Represent a problem using first order logic and propositional logic.
CO-4	Apply the Baye's rule to solve the problem
CO-5	Analyze the different learning systems to solve a given problem.
Course Code: 21AMAMT3030	
Course Title: Database Management Systems	
CO-1	Understand the basic elements of a relational database management system.
CO-2	Draw entity relationship and convert entity relationship diagrams into RDBMS
CO-3	Create, maintain, and manipulate a relational database using SQL.
CO-4	Designs and applies normalization techniques for logical schema model.
CO-5	Solves concurrent issues and problems through locking mechanism.
Course Code: 21AMAMT3040	
Course Title: Operating Systems	
CO-1	Design various Scheduling algorithms, Apply the principles of concurrency.
CO-2	Design deadlock, prevention and avoidance algorithms.
CO-3	Compare and contrast various memory management schemes.
CO-4	Design and Implement a prototype file system, Perform administrative tasks on Linux Servers.
CO-5	Introduction to Android Operating System Internals.
Course Code: 21AMAMT3050	
Course Title: Analog & Digital Electronics	
CO-1	Understand the characteristics and utilization of various components.
CO-2	Understand and analyze the BJT and MOSFET
CO-3	Apply the Boolean algebra to optimize the logic functions using K-maps and Understand the field effect transistors
CO-4	To design and analyze combinational logic circuits
CO-5	To design and analyze sequential logic circuits.

Course Code: 21AMAML3060	
Course Title: Artificial Intelligence Lab	
CO-1	Identify problems that are amenable to solution by AI methods.
CO-2	Identify appropriate AI methods to solve given problem.
CO-3	Use language framework of different AI methods for solving problems.
CO-4	Implement basic AI algorithms.
CO-5	Design and carry out an empirical evaluation of different algorithms on the Problem formalization, and state the conclusions that the evaluation Supports.
Course Code: 21AMAML3080	
Course Title: Database Management Systems Lab	
CO-1	To generate queries using operators in SQL
CO-2	Queries on Controlling Data: Commit, Rollback, and Save point
CO-3	Write a PL/SQL Code using Basic Variable, Anchored Declarations, and Usage of Assignment Operation
CO-4	Write a PL/SQL Code Bind and Substitution Variables. Printing in PL/SQL
CO-5	Write a PL/SQL Code using Procedures, Functions, and Packages FORMS
Course Code: 21AMAMC3090	
Course Title: Python for Data Science	
CO-1	Describe common Excel functionality and features used for data science
CO-2	Analyze and construct the data Visualization
CO-3	Configure the programming environment
CO-4	Analyze real time data set
CO-5	Implement Pivot tables and LOOKUP functions
Course Code: 21AMBIN3100	
Course Title: Biology for Engineers	
CO-1	Describe how biological observations of 18th Century that lead to major discoveries.
CO-2	Convey that classification per se is not what biology is all about but highlightthe underlying criteria, such as morphological, biochemical and ecological
CO-3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
CO-4	Convey that all forms of life have the same building blocks and yet the manifestationsare as diverse as one can imagine
CO-5	Classifyenzymesanddistinguishbetweendifferentmechanismsofenzymeaction.
CO-6	Convey that “Genetics is to biology what Newton’s laws are to Physical Sciences”
Course Outcomes for Second Year Second Semester Course	
Course Code: 21AMMAT4010	
Course Title: Discrete Mathematics	
CO-1	Analyze natural language arguments by means of symbolic propositional logic.

CO-2	Identify and manipulate basic mathematical objects such as sets, functions, and relations.
CO-3	Use of basic theorems in number theory to solve exponential problems.
CO-4	Solve recurrence relations by using different methods.
CO-5	Apply graph theory concepts to solve real-time problems.
Course Code: 21AMAMT4020	
Course Title: Introduction to Machine Learning	
CO-1	Understand the Machine learning principles and data sets
CO-2	Analyze different Machine learning algorithms
CO-3	Analyze the supervised learning methods
CO-4	Analyze unsupervised learning methods
CO-5	Understand and Analyze the Decision Tree learning, Bayesian learning
Course Code: 21AMAMT4030	
Course Title: Design and Analysis of Algorithms	
CO-1	Analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms.
CO-2	Describe the greedy paradigm and explainwhen an algorithmic design situation calls for it. For a given problem develop the greedy algorithms.
CO-3	Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Synthesize divide-and-conquer algorithms. Derive and solve recurrence relation.
CO-4	Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it.
CO-5	For a given problems of dynamic-programming an develop the dynamic programming algorithms andanalyze it to determine its computational complexity.For a given model engineering problem model it is using
Course Code: 21AMAMT4040	
Course Title: Java Programming	
CO-1	Design classes, interfaces and packages.
CO-2	Demonstrate inheritance, polymorphism, encapsulation.
CO-3	Demonstrate user defined exceptions.
CO-4	Create Threads to parallelize operations.
CO-5	Create rich user-interface applications using modern APIJavaFX.
Course Code: 21AMAMT4050	
Course Title: Optimization Techniques for AI	
CO-1	State and formulate the optimization problem, without and with constraints, by using design variables from an engineering design problem.
CO-2	Apply classical optimization techniques to minimize or maximize a multi-variable objective function, without or with constraints, and arrive at an optimal solution.
CO-3	Formulate a mathematical model and apply linear programming technique by using Simplex method. Also extend the concept of dual Simplex

	method for optimal solutions.
CO-4	Apply gradient and non-gradient methods to nonlinear optimization problems and use interior or exterior penalty functions for the constraints to derive the optimal solutions.
CO-5	Able to apply Genetic algorithms for solving Engineering problems.
Course Code: 21AMAML4060	
Course Title: Machine Learning Lab	
CO-1	Understand the implementation procedures for the machine learning algorithms
CO-2	Design Java/Python programs for various Learning algorithms.
CO-3	Apply appropriate data sets to the Machine Learning algorithms
CO-4	Identify and apply Machine Learning algorithms to solve real world problems
Course Code: 21AMAML4070	
Course Title: Design and Analysis of Algorithms Lab	
CO-1	For a given algorithms analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms.
CO-2	Describe the greedy paradigm and explain when an algorithmic design situation calls for it. For a given problem develop the greedy algorithms.
CO-3	Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Synthesize divide-and-conquer algorithms. Derive and solve recurrence relation.
CO-4	Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it.
CO-5	For a given problem of dynamic-programming an develop the dynamic programming algorithms and analyze it to determine its computational complexity.
Course Code: 21AMAML4080	
Course Title: Java Programming Lab	
CO-1	Understand and Apply Object oriented features and Java concepts.
CO-2	Examine and analyze alternative solutions to a given problem using java.
CO-3	Apply the concept of multithreading and implement exception handling.
CO-4	Implement front end and back end of an application using Java
CO-5	Develop applications using Console I/O and File I/O, GUI applications.
Course Code: 21AMAMC4090	
Course Title: Fundamentals of Programming and Simulation using MATLAB for AI	
CO-1	Understand and apply the programming skills to solve problems.
CO-2	Understand the programming in MATLAB using polynomials.
CO-3	To find solutions of nonlinear equations and also apply AI techniques to solve problems using MATLAB.
CO-4	To understand Simulation skills to apply for solving engineering problems.

CO-5	To understand different AI tool boxes to solve problems.
Course Outcomes for Third Year First Semester Course	
Course Code: 21AMMAT5010	
Course Title: Engineering Economics & Financial Management	
CO-1	Students are equipped with the knowledge of managerial economics and estimating demand for a product.
CO-2	Students understand Production and Cost concepts, estimating Cost Break even Analysis.
CO-3	Students are equipped with the knowledge on Markets and Pricing methods along with Business Cycles.
CO-4	Students are able to understand Accounting Concepts and Prepare Financial Statements- Analysis
CO-5	Students are able to analyze various investment project proposals with the help of Capital Budgeting techniques.
Course Code: 21AMAMT5020	
Course Title: Computer Networks	
CO-1	Understand OSI and TCP/IP models
CO-2	Analyze MAC layer protocols and LAN technologies
CO-3	Design applications using internet protocols
CO-4	Understand routing and congestion control algorithms
CO-5	Understand how internet works.
Course Code: 21AMAMT5030	
Course Title: Software Engineering	
CO-1	Define and develop a software project from requirement gathering to implementation.
CO-2	Obtain knowledge about principles and practices of software engineering
CO-3	Focus on the fundamentals of software project
CO-4	Focus on modelling a software project
CO-5	Obtain knowledge about estimation and maintenance of software systems
Course Code: 21AMAMT504A	
Course Title: Graph Theory	
CO-1	Know some important classes of graph theoretic problems;
CO-2	Know connected graphs and shortestvpaths;
CO-3	Be able to formulate and prove central theorems about trees, matching, connectivity, colouring and planar graphs;
CO-4	Be able to describe and apply some basic algorithms for graphs;
CO-5	Be able to use graph theory as a modelling tool.
Course Code: 21AMAMT504B	
Course Title: Web Programming	
CO-1	Understand the basic concepts of HTML and CSS & apply those concepts to design static web pages.
CO-2	Identify and understand various concepts related to dynamic web pages and validate them using JavaScript.

CO-3	Able to connect a java program to a DBMS and perform insert, update and delete operations on DBMS table.
CO-4	Able to write server-side applications using servlets.
CO-5	Outline the concepts of Extensible markup language.
Course Code: 21AMAMT504C	
Course Title: Computer Vision and Robotics	
CO-1	Implement fundamental image processing techniques required for computer vision
CO-2	Implement boundary tracking techniques.
CO-3	Apply chain codes and other region descriptors, Hough Transform for line, circle, and ellipse detections.
CO-4	Apply 3D vision techniques and Implement motion related techniques.
CO-5	Develop applications using computer vision techniques.
Course Code: 21AMAMT504D	
Course Title: Computer Graphics	
CO-1	Acquire knowledge on the fundamental concepts and theory of computer graphics.
CO-2	Acquire familiarity with the relevant mathematics of computer graphics.
CO-3	Be able to design basic graphics application programs.
CO-4	Be able to design animations.
CO-5	Be able to design applications that display graphic images to given specifications.
Course Code: 21AMAML5060	
Course Title: Computer Networks Lab	
CO-1	Understand and explain the basic concepts of Grid Computing.
CO-2	Explain the advantages of using Grid Computing within a given environment
CO-3	Prepare for any upcoming Grid deployments and be able to get started with a potentially available Grid setup.
CO-4	Discuss some of the enabling technologies e.g. high-speed links and storage area networks.
CO-5	Build computer grids.
Course Code: 21AMAML5070	
Course Title: Software Engineering Lab	
CO-1	Able to translate end-user requirements into system and software requirements
CO-2	Able to generate a high-level design of the system from the software requirements
CO-3	Able to have experience and/or awareness of testing problems and will be able to develop a simple testing report
Course Code: 21AMASC5080	
Course Title: Soft Skills & Aptitude builder I	
CO-1	Re-engineer attitude and understand its influence on behaviour
CO-2	Develop interpersonal skills and be an effective goal oriented team player
CO-3	Develop holistic personality with a mature outlook to function effectively in different circumstances

CO-4	Solve the real-time problems for performing job functions easily
CO-5	Analyse the problems logically and critically
Course Code: 21AMAMC5090	
Course Title: Intellectual Property Rights	
CO-1	Understand Intellectual property rights and its types.
CO-2	Demonstrate the Trade Marks of IPR.
CO-3	Demonstrate the law of copy rights.
CO-4	Demonstrate the trade secret laws and trade secrets.
CO-5	Demonstrate new developments in intellectual property laws.

SITE 18 Regulations
M.Tech.-Power Electronics

Course Outcomes for M.Tech First Semester Course	
Course Code: 18EEPE101	
Course Title: Modelling and Analysis of Electrical Machines	
CO-1	Apply knowledge of behavior of DC motors to model and analyze for different applications.
CO-2	Analyze the characteristics of different types of DC motors to design suitablecontrollers.
CO-3	Apply the knowledge of reference frame theory for AC machines to model the induction and Synchronous machines.
CO-4	Evaluate the steady state and transient behavior of induction and synchronous machines to Propose the suitability of drives for different industrial applications.
CO-5	Analyze the 2-Phase induction machines using voltage and torque equations to differentiate the behavior and to propose their applications in real world.
Course Code: 18EEPE102	
Course Title: Analysis of Power Electronic Converters	
CO-1	Analyze the operation of phase controlled converters and AC voltage converters.
CO-2	Analyze the behavior of converters for different loads.
CO-3	Analyze the requirements of power factor correction in converter circuits.
CO-4	Describe and analyse the operation of 3-phase inverters with and without PWMtechniques.
CO-5	Describe principles of operation and features of multilevel inverters.
Course Code: 18EEPE103	
Course Title: Power Semiconductor Devices and Modelling	
CO-1	Select power electronic devices for different applications.
CO-2	Analyze performance characteristics of current controlled devices.
CO-3	Analyze performance characteristics of voltage controlled devices.
CO-4	Analyze the operation of firing and protective circuits.
CO-5	Design thermal protection for power electronic devices.
Course Code: 18EEPE104	
Course Title: Power Electronic Control of DC Drives	
CO-1	Analyze single phase and three phase converter fed DC drives.
CO-2	Design of current controller and speed controller.
CO-3	Analyze the two quadrants and four quadrant controls of DC motor drives.
CO-4	Develop the mathematical models of DC drive components
CO-5	Analyze the four quadrant and closed loop control of DC-DC converter fed DC drive.
Course Code: 18EEPE105A	

Course Title: SPECIAL ELECTRICAL MACHINES	
CO-1	Analyze the characteristics of different types of PM type brushless DC motors and design suitable controllers.
CO-2	Apply the knowledge of sensors used in PMSM which can be used for controllers andsynchronous machines.
CO-3	Analyze the different controllers used in electrical machines to propose the suitabilityof drives for different industrial applications.
CO-4	Classify the types of DC linear motors and apply the knowledge of controllers to propose their application in real world.
CO-5	Evaluate the steady state and transient behavior linear induction motors.
Course Code: 18EEPE105B	
Course Title: HVDC TRANSMISSION	
CO-1	Understand the various schemes of HVDC transmission.
CO-2	Understand the basic HVDC transmission equipment.
CO-3	Understand the control of HVDC systems.
CO-4	Understand the interaction between HVAC and HVDC system.
CO-5	Understand the various protection schemes of HVDC engineering.
Course Code: 18EEPE106A	
Course Title: HYBRID AND ELECTRICAL VEHICLES	
CO-1	Explore fundamental concepts of hybrid electric Vehicles.
CO-2	Analyze the performance of electric and hybrid electric vehicles.
CO-3	Analyze the control of different motor drives.
CO-4	Illustrate selection of energy storage technology, Communications, supportingsubsystems.
CO-5	Illustrate different energy management strategies for hybrid electric vehicles
Course Code: 18EEPE106B	
Course Title: STATIC VAR CONTROLLERS AND HARMONICFILTERING	
CO-1	Acquire knowledge about the fundamental principles of Passive and ActiveReactive Power Compensation Schemes at Transmission and Distribution level in Power Systems.
CO-2	Acquire knowledge about different power quality issues.
CO-3	To introduce the student to various single phase and three-phase Static VAR Compensation schemes and their controls.
CO-4	To develop analytical modeling skills needed for modeling and analysis of suchStaticVAR.
CO-5	Acquire knowledge about different types of filters and their control.
Course Code: 18EEPE151	
Course Title: SYSTEMS SIMULATION LABORATORY	
CO-1	Analyze the characteristics of power semiconductor devices in simulation.
CO-2	Analyze the characteristics of power semiconductor devices in simulation.
CO-3	Analyze and implement PWM techniques in simulation.
CO-4	Analyze the mathematical model of the induction machine.
CO-5	Analyze and implement the speed controlling techniques for AC machines insimulation.

Course Outcomes for M.Tech Second Semester Course	
Course Code: 18EEPE201	
Course Title: POWER ELECTRONIC CONTROL OF AC DRIVES	
CO-1	Explain operation of induction motor and analyze speed control of AC drives by VSIfed drives.
CO-2	Acquire knowledge of vector control of induction motors.
CO-3	Analyze control schemes to synchronous motor drives.
CO-4	Analyze the operation of traction drives.
CO-5	Analyze the control of switched reluctance motor & stepper motor.
Course Code: 18EEPE202	
Course Title: POWER CONVERTERS FOR RENEWABLE ENERGY SYSTEMS	
CO-1	Acquire the knowledge of applications of power converters in renewable energy systems.
CO-2	Analyze operation and control of photovoltaic and wind energy systems with help ofpower converters.
CO-3	Use the design techniques of power converters.
CO-4	Acquire the knowledge of the energy management system.
CO-5	Acquire the knowledge of the energy management system.
Course Code: 18EEPE203	
Course Title: CUSTOM POWER DEVICES	
CO-1	Analyze the effect of various power quality issues in distribution system and their mitigation principles.
CO-2	Analyze working and operation of compensation devices.
CO-3	Describe the operation of custom power devices for reactive power & harmonic compensation.
CO-4	Analyze high speed transfer switches.
CO-5	Analyze the operation and control of custom power devices in power systemapplications.
Course Code: 18EEPE204A	
Course Title: ARTIFICIAL INTELLIGENCE TECHNIQUES	
CO-1	Acquire the knowledge of neural networks and analyze different types of neural networks.
CO-2	Design training algorithms for neural networks.
CO-3	Develop algorithms using genetic algorithm for optimization.
CO-4	Analyze and design fuzzy logic systems.
CO-5	Apply AI Techniques in power electronics and DC drives.
Course Code: 18EEPE204B	
Course Title: DIGITAL CONTROLLERS	
CO-1	Know the interfacing circuits for input and output to PIC micro controllers and DSP processors.
CO-2	Know how to write ALP for DSP processors
CO-3	Design PWM controls for power electronic circuits using FPGA
CO-4	Know how to write HDL programming.
CO-5	Acquire the basics of programming in Xilinx.

Course Code: 18EEPE205A	
Course Title: MODELLING & SIMULATION OF POWER ELECTRONICS AND DRIVE SYSTEMS	
CO-1	Develop mathematical models for different power electronic converters.
CO-2	Simulate various power converters using PSPICE and MATLAB.
CO-3	Analyze power electronic circuits for different loads.
CO-4	Develop mathematical models of DC-DC converters.
CO-5	Develop mathematical models of Inverters.
Course Code: 18EEPE205B	
Course Title: SMART GRID TECHNOLOGIES	
CO-1	Analyze the smart grid policies and developments in smart grids.
CO-2	Develop concepts of smart grid technologies in hybrid electrical vehicles etc.
CO-3	Acquire the knowledge of smart substations, feeder automation, GIS etc.
CO-4	Analyze micro grids and distributed generation systems.
CO-5	Analyze the effect of power quality in smart grid and to understand latestdevelopments in ICT for smart grid.
Course Code: 18EEPE206A	
Course Title: SWITCH MODE AND RESONANT CONVERTERS	
CO-1	Acquire the knowledge of different types of converters
CO-2	Acquire the knowledge of different switch mode topologies & control methods
CO-3	Acquire the knowledge of different resonant converter topologies.
CO-4	Acquire the knowledge of different control techniques for SMPS.
CO-5	Design of filters for reducing EMI.
Course Code: 18EEPE206B	
Course Title: OPTIMIZATION TECHNIQUES	
CO-1	State and formulate the optimization problem, without and with constraints, byusing design variables from an engineering design problem.
CO-2	Apply classical optimization techniques to minimize or maximize a multi-variableobjective function, without or with constraints, and arrive at an optimal solution.
CO-3	Formulate a mathematical model and apply linear programming technique by usingSimplex method. Also extend the concept of dual Simplex method for optimal solutions.
CO-4	Apply gradient and non-gradient methods to nonlinear optimization problems and use interior or exterior penalty functions for the constraints to derive the optimal solutions.
CO-5	Able to apply Genetic algorithms for simple electrical problems.
Course Code: 18EEPE251	
Course Title: ELECTRICAL DRIVES LABORATORY	
CO-1	Analyze and verify the speed control of DC motor using 3-phase full converter andfour quadrant chopper.

CO-2	Analyze the operation of AC voltage controller with R,RL loads.
CO-3	Analyze and verify the operation of Buck,Boost,Buck-Boost DC-DC converters.
CO-4	Analyze single phase and three phase IGBT based PWM inverter.
CO-5	Analyze the application of digital controllers in induction motor control.
Course Outcomes for M.Tech Third Semester Course	
Course Code: 18EEPE3001	
Course Title: DESIGN OF PHOTOVOLTAIC SYSTEMS	
CO-1	Awareness of students to the feasibility of PV systems as an alternative to the fossil fuels will be gained.
CO-2	The knowledge of the Modeling, analysis, design and application of variousphotovoltaic systems will be acquired by the students.
CO-3	Modeling of solar cells including the effects of temperature.
CO-4	Power conditioning and maximum power point tracking (MPPT) algorithms basedon buck- and boost-converter topologies.
CO-5	Feasible operating region of inverter at different power factor values for grid-connected systems.

SITE 21 Regulation

M.Tech. Power Electronics

Course Outcomes for M.Tech First Semester Course	
Course Code: 21EEPE101	
Course Title: Modelling and Analysis of Electrical Machines	
CO-1	Apply knowledge of behavior of DC motors to model and analyze for different applications.
CO-2	Analyze the characteristics of different types of DC motors to design suitablecontrollers.
CO-3	Apply the knowledge of reference frame theory for AC machines to model the induction and Synchronous machines.
CO-4	Evaluate the steady state and transient behavior of induction and synchronous machines to Propose the suitability of drives for different industrial applications.
CO-5	Analyze the 2-Phase induction machines using voltage and torque equations to differentiate the behavior and to propose their applications in real world.
Course Code: 21EEPE102	
Course Title: Analysis of Power Electronic Converters	
CO-1	Analyze the operation of phase controlled converters and AC voltage converters.
CO-2	Analyze the behavior of converters for different loads.
CO-3	Analyze the requirements of power factor correction in converter circuits.
CO-4	Describe and analyse the operation of 3-phase inverters with and without PWMtechniques.
CO-5	Describe principles of operation and features of multilevel inverters.
Course Code: 21EEPE103	
Course Title: Power Semiconductor Devices and Modelling	
CO-1	Select power electronic devices for different applications.
CO-2	Analyze performance characteristics of current controlled devices.
CO-3	Analyze performance characteristics of voltage controlled devices.
CO-4	Analyze the operation of firing and protective circuits.
CO-5	Design thermal protection for power electronic devices.
Course Code: 21EEPE104	
Course Title: Power Electronic Control of DC Drives	
CO-1	Analyze single phase and three phase converter fed DC drives.
CO-2	Design of current controller and speed controller.
CO-3	Analyze the two quadrants and four quadrant controls of DC motor drives.
CO-4	Develop the mathematical models of DC drive components
CO-5	Analyze the four quadrant and closed loop control of DC-DC converter fed DC drive.
Course Code: 21EEPE105A	
Course Title: SPECIAL ELECTRICAL MACHINES	

CO-1	Analyze the characteristics of different types of PM type brushless DC motors and design suitable controllers.
CO-2	Apply the knowledge of sensors used in PMSM which can be used for controllers andsynchronous machines.
CO-3	Analyze the different controllers used in electrical machines to propose the suitabilityof drives for different industrial applications.
CO-4	Classify the types of DC linear motors and apply the knowledge of controllers to propose their application in real world.
CO-5	Evaluate the steady state and transient behavior linear induction motors.
Course Code: 21EEPE105B	
Course Title: HVDC TRANSMISSION & FACTS	
CO-1	Compare HVDC and EHVAC transmission systems.
CO-2	Analyze converter configurations used in HVDC and evaluate the performance metrics.
CO-3	Understand controllers for controlling the power flow through a dc link and computefilter Parameters.
CO-4	Apply impedance, phase angle and voltage control for real and reactive power flow in ac transmission systems with FACTS controller.
CO-5	Analyze and select a suitable FACTS controller for a given power flow condition.
Course Code: 21EEPE106A	
Course Title: HYBRID AND ELECTRICAL VEHICLES	
CO-1	Explore fundamental concepts of hybrid electric Vehicles.
CO-2	Analyze the performance of electric and hybrid electric vehicles.
CO-3	Analyze the control of different motor drives.
CO-4	Illustrate selection of energy storage technology, Communications, supportingsubsystems.
CO-5	Illustrate different energy management strategies for hybrid electric vehicles
Course Code: 21EEPE106B	
Course Title: DIGITAL CONTROL SYSTEMS	
CO-1	Analyze digital control systems using Z-transforms and Inverse Z-Transforms.
CO-2	Evaluate the state transition matrix and solve state equation for discrete model forcontinuous time systems, investigate the controllability and observability.
CO-3	Determine the stability; design state feedback controller.
CO-4	Design an observer.
CO-5	Solve a given optimal control problem.
Course Code: 21EEPE151	
Course Title: SYSTEMS SIMULATION LABORATORY	
CO-1	Analyze the characteristics of power semiconductor devices in simulation.
CO-2	Analyze the characteristics of power semiconductor devices in simulation.
CO-3	Analyze and implement PWM techniques in simulation.
CO-4	Analyze the mathematical model of the induction machine.
CO-5	Analyze and implement the speed controlling techniques for AC machines insimulation.

Course Outcomes for M.Tech Second Semester Course	
Course Code: 21EEPE201	
Course Title: POWER ELECTRONIC CONTROL OF AC DRIVES	
CO-1	Explain operation of induction motor and analyze speed control of AC drives by VSIfed drives.
CO-2	Acquire knowledge of vector control of induction motors.
CO-3	Analyze control schemes to synchronous motor drives.
CO-4	Analyze the operation of traction drives.
CO-5	Analyze the control of switched reluctance motor & stepper motor.
Course Code: 21EEPE202	
Course Title: POWER CONVERTERS FOR RENEWABLE ENERGY SYSTEMS	
CO-1	Acquire the knowledge of applications of power converters in renewable energy systems.
CO-2	Analyze operation and control of photovoltaic and wind energy systems with help ofpower converters.
CO-3	Use the design techniques of power converters.
CO-4	Acquire the knowledge of the energy management system.
CO-5	Acquire the knowledge of the energy management system.
Course Code: 21EEPE203	
Course Title: POWER QUALITY & CUSTOM POWER DEVICES	
CO-1	Identify the issues related to power quality in power systems.
CO-2	Address the problems of transient and long duration voltage variations in powersystems.
CO-3	Address the problems of transient and long duration voltage variations in power systems.
CO-4	Identify the importance of custom power devices and their applications.
CO-5	Acquire knowledge on different compensation techniques to minimize power qualitydisturbances.
Course Code: 21EEPE204A	
Course Title: ARTIFICIAL INTELLIGENCE TECHNIQUES	
CO-1	Acquire the knowledge of neural networks and analyze different types of neural networks.
CO-2	Design training algorithms for neural networks.
CO-3	Develop algorithms using genetic algorithm for optimization.
CO-4	Analyze and design fuzzy logic systems.
CO-5	Apply AI Techniques in power electronics and DC drives.
Course Code: 21EEPE204B	
Course Title: DIGITAL CONTROLLERS	
CO-1	Know the interfacing circuits for input and output to PIC micro controllers andDSPprocessors.

CO-2	Know how to write ALP for DSP processors
CO-3	Design PWM controls for power electronic circuits using FPGA
CO-4	Know how to write HDL programming.
CO-5	Acquire the basics of programming in Xilinx.
Course Code: 21EEPE205A	
Course Title: MODELLING & SIMULATION OF POWER ELECTRONICS AND DRIVE SYSTEMS	
CO-1	Develop mathematical models for different power electronic converters.
CO-2	Simulate various power converters using PSPICE and MATLAB.
CO-3	Analyze power electronic circuits for different loads.
CO-4	Develop mathematical models of DC-DC converters.
CO-5	Develop mathematical models of Inverters.
Course Code: 21EEPE205B	
Course Title: SMART GRID TECHNOLOGIES	
CO-1	Analyze the smart grid policies and developments in smart grids.
CO-2	Develop concepts of smart grid technologies in hybrid electrical vehicles etc.
CO-3	Acquire the knowledge of smart substations, feeder automation, GIS etc.
CO-4	Analyze micro grids and distributed generation systems.
CO-5	Analyze the effect of power quality in smart grid and to understand latestdevelopments in ICT for smart grid.
Course Code: 21EEPE206A	
Course Title: SWITCH MODE AND RESONANT CONVERTERS	
CO-1	Acquire the knowledge of different types of converters
CO-2	Acquire the knowledge of different switch mode topologies & control methods
CO-3	Acquire the knowledge of different resonant converter topologies.
CO-4	Acquire the knowledge of different control techniques for SMPS.
CO-5	Design of filters for reducing EMI.
Course Code: 21EEPE206B	
Course Title: OPTIMIZATION TECHNIQUES	
CO-1	State and formulate the optimization problem, without and with constraints, byusing design variables from an engineering design problem.
CO-2	Apply classical optimization techniques to minimize or maximize a multi-variableobjective function, without or with constraints, and arrive at an optimal solution.
CO-3	Formulate a mathematical model and apply linear programming technique by usingSimplex method. Also extend the concept of dual Simplex method for optimal solutions.
CO-4	Apply gradient and non-gradient methods to nonlinear optimization problems and use interior or exterior penalty functions for the constraints to derive the optimal solutions.

CO-5	Able to apply Genetic algorithms for simple electrical problems.
Course Code: 21EEPE251	
Course Title: ELECTRICAL DRIVES LABORATORY	
CO-1	Analyze and verify the speed control of DC motor using 3-phase full converter andfour quadrant chopper.
CO-2	Analyze the operation of AC voltage controller with R,RL loads.
CO-3	Analyze and verify the operation of Buck,Boost,Buck-Boost DC-DC converters.
CO-4	Analyze single phase and three phase IGBT based PWM inverter.
CO-5	Analyze the application of digital controllers in induction motor control.
Course Outcomes for M.Tech Third Semester Course	
Course Code: 21EEPE3001	
Course Title: DESIGN OF PHOTOVOLTAIC SYSTEMS	
CO-1	Awareness of students to the feasibility of PV systems as an alternative to the fossil fuels will be gained.
CO-2	The knowledge of the Modeling, analysis, design and application of variousphotovoltaic systems will be acquired by the students.
CO-3	Modeling of solar cells including the effects of temperature.
CO-4	Power conditioning and maximum power point tracking (MPPT) algorithms basedon buck- and boost-converter topologies.
CO-5	Feasible operating region of inverter at different power factor values for grid-connected systems.

SITE 18 Regulation

M.Tech.- Computer Aided Design and Computer Aided Manufacturing

GEOMETRIC MODELING
SITE 18 I M.Tech. I Semester CAD/CAM

1. Students are able to produce engineering drawings.
2. Students are able to apply the techniques of GM
3. Students are able to draw the Models of complex curves and surfaces.
4. Students are able to Integrate the role of graphic communication in the engineering designprocess
5. Students are able to Generate various curves and surfaces using Computer graphics.

COMPUTER AIDED MANUFACTURING
SITE 18 M.Tech. I Semester CAD/CAM

1. Understand the principles of Numerical Control (NC) technology and describe the range ofmachine tools to which it is applied.
2. Outline the various routs for part programming in NC and CNC.
3. Explain the application of CNC for Machining & Turning Centers.
4. Apply the use of various transducers, Micro controllers encoders and feedback devices in CAM.
5. Apply the principles of Computer Aided Process Planning in CAM

COMPUTATIONAL METHODS IN ENGINEERING(ELECTIVE I)
SITE 18 I M.Tech. I Semester CAD/CAM

1. Understand numerical methods in many branches of Applied Mathematics i.e quantummechanics, fluid mechanics and electrical engineering.
2. Solve Boundry value problems and charecteristic value problems
3. Understand the Transformation techniques
4. Understand the Numerical differentiation
5. Understand the Numerical Integration

MATERIALS TECHNOLOGY(ELECTIVE I)
SITE 18 I M.Tech. I Semester CAD/CAM

Course outcomes

On completion of this course, students will be able to

1. Students will get to know the different classes of materials used in engineering applications andwould be able to choose the right materials for specific applications
2. Students will understand and appreciate the importance of the polymers as an important class ofmaterials
3. They will be able to make the right choice of material for a given loading conditions.
4. Apply the basic principles of ferrous and non-ferrous physical metallurgy for selectingmaterials for specific applications.

MECHANICAL VIBRATIONS(ELECTIVE I)

SITE 18 I M.Tech. I Semester CAD/CAM

1. Gain knowledge on the subject matter.
2. Apply the theory to practical problems.
3. Enhance knowledge to implement the concept for product development.
4. Pursue a career in the field of vibration either in industry or research.

MECHATRONICS (ELECTIVE II)
SITE 18 I M.Tech. I Semester CAD/CAM

1. Illustrate the concept of the mechatronics and different sensors and transducers.
2. Develop the pneumatic and hydraulic actuating system.
3. Asses the control system of PLC.
4. Illustrate the data acquisition.
5. Determine the process controllers

INDUSTRIAL ROBOTICS(ELECTIVE II)
SITE 18 I M.Tech. I Semester CAD/CAM

1. Solve complex problems in robot kinematics, dynamics and control.
2. Understand the applications of robotics for a specialized application.
3. Gain the knowledge on kinematics of robots and adaptive control.
4. Gain the knowledge on sensors and selection of sensors for specific need.
5. Gain the knowledge on robot cell layouts and their applications.

MODELING AND SIMULATION OF MANUFACTURING SYSTEMS(ELECTIVE II)
SITE 18 I M.Tech. I Semester CAD/CAM

1. Understand the concepts of simulation
2. Review the probablilty and statistics
3. Test the different transformation techniques
4. Analyse the simulation data
5. Understand queueing techniques & models

RESEARCH METHODOLOGY AND IPR
SITE 18 I M.Tech. I Semester CAD/CAM

CO1: Understand research problem formulation.
CO2: Analyze research related information
CO3: Follow research ethics
CO4: Understand that today's world is controlled by Computer, Information Technology, buttomorrow world will be ruled by ideas, concept, and creativity.
CO5: Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.
CO6: Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and

better products, and in turn brings about, economic growth and social benefits.
WRITING SKILLS FOR SCIENTIFIC COMMUNICATION **SITE 18 I M.Tech. I Semester CAD/CAM**
CO1. Understand that how to improve your writing skills and level of readability CO2. Learn about what to write in each section CO3. Understand the skills needed when writing a Title Ensure the good quality of paper atvery first time submission
THEORY OF ELASTICITY AND PLASTICITY **SITE 18 I M.Tech. II Semester CAD/CAM**
1. The students shall be able to demonstrate the application of plane stress and plane strainin a given situation. 2. The student will demonstrate the ability to analyze the structure using plasticity. 3. To impart the knowledge of stress-strain relations for linearly elastic solids, andTorsion. 4. Can explain the stress, strain, torsion and bending properties. 5. Apply the concepts of stress, strain, torsion and bending and deflection of bar and beamin engineering field
ADVANCED MANUFACTURING PROCESSES **SITE 18 I M.Tech. II Semester CAD/CAM**
1. Demonstrate various methods of surface coating processes 2. Classify processing techniques for processing of ceramics and composite materials. 3. Identify different fabrication types for microelectronic devices. 4. Compare advanced machining processes and its applications. 5. Describe the concept of rapid prototyping and its manufacturing techniques
ADVANCED FINITE ELEMENT METHOD(ELECTIVE III) **SITE 18 I M.Tech. II Semester CAD/CAM**
1. Identify and formulate different stress and strain relations, displacement relations on aparticular object using FEM methods. 2. Distinguish between the analysis of trusses and beams 3. Analyze a finite element modeling problems of two-dimensional stress by constant straintriangles 4. Apply one dimensional quadratic equation on iso parametric elements and numericalintegrations. 5. Perform dynamic analysis of finite element models.
FRACTURE MECHANICS(ELECTIVE III) **SITE 18 I M.Tech. II Semester CAD/CAM**

1. Apply fracture mechanics to predict brittle fracture. Identify and describe the basic fractureand fatigue mechanisms
2. Understand crack resistance and energy release rate for crack criticality.
3. Apply linear elastic fracture mechanics on brittle materials.
4. Identify the plane stress and plane strain conditions based on the shape and size of plastic zones. This concept made them capable to select the type of analysis subjected to plane stressand plane strain condition
5. Understand the relationship between crack tip opening displacement, sif and err andapplication of such parameters for ductile and brittle materials
6. Understanding of experimental techniques to determine the critical values of parameters atcrack tip

PRODUCT DESIGN AND DEVELOPMENT(ELECTIVE III)
SITE 18 I M.Tech. II Semester CAD/CAM

1. Use the Product Design and Development Process, as a means to manage the development of anidea from concept through to production.
2. Employ research and analysis methodologies as it pertains to the product design process,meaning, and user experience.
3. Use basic fabrication methods to build prototype models for hard-goods and soft-goods andpackaging.
4. Apply creative process techniques in synthesizing information, problem-solving and criticalthinking
5. Demonstrate, apply, explain, and recognize basic family of materials used in soft-goods and hard-goods, including sustainable materials and manufacturing processes.

MATERIALS CHARACTERIZATION TECHNIQUES(ELECTIVE IV)
SITE 18 I M.Tech. II Semester CAD/CAM

Course outcomes

On completion of this course, students will be able to

1) Explain the production of characteristic x-rays.
2) Explain the principles of diffraction (Bragg's Law) and its use in crystal structuredetermination.
3) Explain the properties of electrons and the affect of accelerating potential.
4) Know the basic operational modes of a SEM.
5) Know the basic operational modes of a TEM.
6) Explain the formation of diffraction patterns in the EMs.
7) Understand stereographic projections and their use in characterization of crystalline materials.

OPTIMIZATION AND RELIABILITY(ELECTIVE IV)
SITE 18 I M.Tech. II Semester CAD/CAM

1. Estimating the likely reliability of new designs, and for analysing reliability data
2. Train personnel in specific maintenance skills
3. Advise on the acquisition, installation and operation of machinery
4. Ensure environmental protection.

ADDITIVE MANUFACTURING(ELECTIVE IV)
SITE 18 I M.Tech. II Semester CAD/CAM

1. Explain basic principles of Rapid Prototyping Techniques in the manufacturing of complexcomponents

2. Explain about polymerization and layer by layer generation of manufaturing.
3. Demonstrate Rapid prototyping techniques in product development, rapid tooling
4. Explain indirect tooling requirements of Rapid prototyping.
5. **Explain** direct tooling requirements of Additive Manufacturing

PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLSSITE 18
I M.Tech. II Semester CAD/CAM

1. Study of Shrimad-Bhagwad-Geeta will help the student in developing his personalityand achieve the highest goal in life.
2. The person who has studied Geeta will lead the nation and mankind to peace andprosperity.
3. Study of Neetishatakam will help in developing versatile personality

NON-DESTRUCTIVE EVALUATION (Elective –V)
SITE 18 II M.Tech. III Semester CAD/CAM

1. Illustrate Non-destructive testing (NDT) and inspection techniques (magnetic particle,liquid penetrant, ultrasonics eddy current, radiography).
2. Safety procedures for industrial radiation sources.
3. Evaluate the properties of materials from production to processing to detect defects.Use codes and standards from various industries as accept or reject criteria.
4. Detection of material defects that could cause unreliable product or processperformance or product failure.
5. Visual inspection and quality assurance techniques used in the welding industry.(Introduction to welding processes and quality assurance techniques.)
6. Use codes, standards and specifications to evaluate technical problems, related tomanufacturing or field environments.
7. Generate technical documents to report inspection results.

QUALITY ENGINEERING IN MANUFACTURING(ELECTIVE V)
SITE 18 II M.Tech. III Semester CAD/CAM

Course outcomes

On completion of this course, students will be able to

1) Apply the tools and techniques of quality to resolve industrial engineering issues.
2) Estimate the obvious and hidden quality costs for a given production system.
3) Apply a system based approach for quality management
4) Prepare and analyze various charts/ methods for quality control and improvement.
5) Use plans for sampling and concepts of quality system management.

GREEN MANUFACTURING(ELECTIVE V)
SITE 18 II M.Tech. III Semester CAD/CAM

Course outcomes

On completion of this course, students will be able to

1. Evaluate and practices Green manufacturing system
2. Develop monitoring skills, including conduct of experiments and data analysis for noisepollution.

3. Assess local and global water requirements and its quality.
4. Create and develop better Industrial fire protection systems
5. Follow safe way of treatment and disposal of radioactive waste

NANO TECHNOLOGY(OPEN ELECTIVE I) SITE 18
II M.Tech. III Semester CAD/CAM

1. Explain the importance of Nanotechnology & its emergence in various fields.
2. Identify various synthesis technique of nano materials.
3. Explain different characterization methods of nanostructures.
4. Describe the properties of nanomaterials and their synthesis techniques for electronic applications.
5. Discuss the concept of carbon allotropes in Nano Technology & their applications in electronicand mechanical applications.

OPTIMIZATION TECHNIQUES((OPEN ELECTIVE I))
SITE 18 II M.Tech. III Semester CAD/CAM

1. Apply the theory of optimization methods and algorithms to develop and for solvingvarious types of optimization problems
2. Go in research by applying optimization techniques in problems of Engineering andTechnology
3. Solve the mathematical results and numerical techniques of optimization theory toconcrete Engineering problems by using computer software

PRODUCT DESIGN AND MANUFACTURING((OPEN ELECTIVE I))
SITE 18 II M.Tech. III Semester CAD/CAM

1. Understand the product design and development process.
2. Apply creative thinking skills for idea generation.
3. Translate conceptual ideas into products.
4. Present ideas using various types of models.
5. Learned the art of management for Developing and Launching new products.

SITE 21 Regulation

M.Tech.- Computer Aided Design and Computer Aided Manufacturing

GEOMETRIC MODELING SITE 21 I M.Tech. I Semester CAD/CAM
1. Students are able to produce engineering drawings. 2. Students are able to apply the techniques of GM 3. Students are able to draw the Models of complex curves and surfaces. 4. Students are able to Integrate the role of graphic communication in the engineering designprocess 5. Students are able to Generate various curves and surfaces using Computer graphics.
COMPUTER AIDED MANUFACTURING SITE 21 M.Tech. I Semester CAD/CAM
1. Understand the principles of Numerical Control (NC) technology and describe the range ofmachine tools to which it is applied. 2. Outline the various routs for part programming in NC and CNC. 3. Explain the application of CNC for Machining & Turning Centers. 4. Apply the use of various transducers, Micro controllers encoders and feedback devices in CAM. 5. Apply the principles of Computer Aided Process Planning in CAM
COMPUTATIONAL METHODS IN ENGINEERING(ELECTIVE I) SITE 21 I M.Tech. I Semester CAD/CAM
1. Understand numerical methods in many branches of Applied Mathematics i.e quantummechanics, fluid mechanics and electrical engineering. 2. Solve Boundry value problems and charecteristic value problems 3. Understand the Transformation techniques 4. Understand the Numerical differentiation 5. Understand the Numerical Integration
MATERIALS TECHNOLOGY(ELECTIVE I) SITE 21 I M.Tech. I Semester CAD/CAM
1. Students will get to know the different classes of materials used in engineering applications andwould be able to choose the right materials for specific applications 2. Students will understand and appreciate the importance of the polymers as an important class ofmaterials 3. They will be able to make the right choice of material for a given loading conditions. 4. Apply the basic principles of ferrous and non-ferrous physical metallurgy for selectingmaterials for specific applications.
MECHANICAL VIBRATIONS(ELECTIVE I) SITE 21 I M.Tech. I Semester CAD/CAM
1. Gain knowledge on the subject matter. 2. Apply the theory to practical problems.

3. Enhance knowledge to implement the concept for product development.
4. Pursue a career in the field of vibration either in industry or research.

MECHATRONICS (ELECTIVE II)
SITE 21 I M.Tech. I Semester CAD/CAM

1. Illustrate the concept of the mechatronics and different sensors and transducers.
2. Develop the pneumatic and hydraulic actuating system.
3. Asses the control system of PLC.
4. Illustrate the data acquisition.
5. Determine the process controllers

INDUSTRIAL ROBOTICS(ELECTIVE II)
SITE 21 I M.Tech. I Semester CAD/CAM

1. Solve complex problems in robot kinematics, dynamics and control.
2. Understand the applications of robotics for a specialized application.
3. Gain the knowledge on kinematics of robots and adaptive control.
4. Gain the knowledge on sensors and selection of sensors for specific need.
5. Gain the knowledge on robot cell layouts and their applications.

MODELING AND SIMULATION OF MANUFACTURING SYSTEMS(ELECTIVE II)
SITE 21 I M.Tech. I Semester CAD/CAM

1. Understand the concepts of simulation
2. Review the probablilty and statistics
3. Test the different transformation techniques
4. Analyse the simulation data
5. Understand queueing techniques & models

RESEARCH METHODOLOGY AND IPR
SITE 21 I M.Tech. I Semester CAD/CAM

CO1: Understand research problem formulation.
CO2: Analyze research related information
CO3: Follow research ethics
CO4: Understand that today's world is controlled by Computer, Information Technology, buttomorrow world will be ruled by ideas, concept, and creativity.
CO5: Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.
CO6: Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.

WRITING SKILLS FOR SCIENTIFIC COMMUNICATION
SITE 21 I M.Tech. I Semester CAD/CAM

CO1. Understand that how to improve your writing skills and level of readability
CO2. Learn about what to write in each section
CO3. Understand the skills needed when writing a Title Ensure the good quality of paper atvery first time submission

THEORY OF ELASTICITY AND PLASTICITY
SITE 21 I M.Tech. II Semester CAD/CAM

1. The students shall be able to demonstrate the application of plane stress and plane strainin a given situation.
2. The student will demonstrate the ability to analyze the structure using plasticity.
3. To impart the knowledge of stress-strain relations for linearly elastic solids, andTorsion.
4. Can explain the stress, strain, torsion and bending properties.
5. Apply the concepts of stress, strain, torsion and bending and deflection of bar and beamin engineering field

ADVANCED MANUFACTURING PROCESSES
SITE 21 I M.Tech. II Semester CAD/CAM

1. Demonstrate various methods of surface coating processes
2. Classify processing techniques for processing of ceramics and composite materials.
3. Identify different fabrication types for microelectronic devices.
4. Compare advanced machining processes and its applications.
5. Describe the concept of rapid prototyping and its manufacturing techniques

ADVANCED FINITE ELEMENT METHOD(ELECTIVE III)
SITE 21 I M.Tech. II Semester CAD/CAM

1. Identify and formulate different stress and strain relations, displacement relations on aparticular object using FEM methods.
2. Distinguish between the analysis of trusses and beams
3. Analyze a finite element modeling problems of two-dimensional stress by constant straintriangles
4. Apply one dimensional quadratic equation on iso parametric elements and numericalintegrations.
5. Perform dynamic analysis of finite element models.

FRACTURE MECHANICS(ELECTIVE III)
SITE 21 I M.Tech. II Semester CAD/CAM

1. Apply fracture mechanics to predict brittle fracture. Identify and describe the basic fractureand fatigue mechanisms
2. Understand crack resistance and energy release rate for crack criticality.
3. Apply linear elastic fracture mechanics on brittle materials.
4. Identify the plane stress and plane strain conditions based on the shape and size of plastic zones. This concept made them capable to select the type of analysis subjected to plane stressand plane strain condition
5. Understand the relationship between crack tip opening displacement, sif and err andapplication of such parameters for ductile and brittle materials
6. Understanding of experimental techniques to determine the critical values of parameters atcrack tip

PRODUCT DESIGN AND DEVELOPMENT(ELECTIVE III)

SITE 21 I M.Tech. II Semester CAD/CAM

1. Use the Product Design and Development Process, as a means to manage the development of anidea from concept through to production.
2. Employ research and analysis methodologies as it pertains to the product design process,meaning, and user experience.
3. Use basic fabrication methods to build prototype models for hard-goods and soft-goods andpackaging.
4. Apply creative process techniques in synthesizing information, problem-solving and criticalthinking
5. Demonstrate, apply, explain, and recognize basic family of materials used in soft-goods and hard-goods, including sustainable materials and manufacturing processes.

MATERIALS CHARACTERIZATION TECHNIQUES(ELECTIVE IV)
SITE 21 I M.Tech. II Semester CAD/CAM

1. Explain the production of characteristic x-rays.
2. Explain the principles of diffraction (Bragg's Law) and its use in crystal structuredetermination.
3. Explain the properties of electrons and the affect of accelerating potential.
4. Know the basic operational modes of a SEM.and TEM
5. Know Understand stereographic projections and their use in characterization of crystalline materials.

OPTIMIZATION AND RELIABILITY(ELECTIVE IV)
SITE 21 I M.Tech. II Semester CAD/CAM

1. Estimating the likely reliability of new designs, and for analysing reliability data
2. Train personnel in specific maintenance skills
3. Advise on the acquisition, installation and operation of machinery
4. Ensure environmental protection.

ADDITIVE MANUFACTURING(ELECTIVE IV)
SITE 21 I M.Tech. II Semester CAD/CAM

1. Explain basic principles of Rapid Prototyping Techniques in the manufacturing of complexcomponents
2. Explain about polymerization and layer by layer generation of manufaturing.
3. Demonstrate Rapid prototyping techniques in product development, rapid tooling
4. Explain indirect tooling requirements of Rapid prototyping.
5. **Explain** direct tooling requirements of Additive Manufacturing

PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLSSITE 21
I M.Tech. II Semester CAD/CAM

1. Study of Shrimad-Bhagwad-Geeta will help the student in developing his personalityand achieve the highest goal in life.
2. The person who has studied Geeta will lead the nation and mankind to peace andprosperity.
3. Study of Neetishatakam will help in developing versatile personality

NON-DESTRUCTIVE EVALUATION (Elective –V)
SITE 21 II M.Tech. III Semester CAD/CAM

1. Illustrate Non-destructive testing (NDT) and inspection techniques (magnetic particle,liquid penetrant, ultrasonics eddy current, radiography).
2. Safety procedures for industrial radiation sources.
3. Evaluate the properties of materials from production to processing to detect defects.Use codes and standards from various industries as accept or reject criteria.
4. Detection of material defects that could cause unreliable product or processperformance or product failure.
5. Visual inspection and quality assurance techniques used in the welding industry.(Introduction to welding processes and quality assurance techniques.)

QUALITY ENGINEERING IN MANUFACTURING(ELECTIVE V)
SITE 21 II M.Tech. III Semester CAD/CAM

1. Apply the tools and techniques of quality to resolve industrial engineering issues.
2. Estimate the obvious and hidden quality costs for a given production system.
3. Apply a system based approach for quality management
4. Prepare and analyze various charts/ methods for quality control and improvement.
5. Use plans for sampling and concepts of quality system management.

GREEN MANUFACTURING(ELECTIVE V)
SITE 21 II M.Tech. III Semester CAD/CAM

1. Evaluate and practices Green manufacturing system
2. Develop monitoring skills, including conduct of experiments and data analysis for noisepollution.
3. Assess local and global water requirements and its quality.
4. Create and develop better Industrial fire protection systems
5. Follow safe way of treatment and disposal of radioactive waste

NANO TECHNOLOGY(OPEN ELECTIVE I) SITE 21
II M.Tech. III Semester CAD/CAM

1. Explain the importance of Nanotechnology & its emergence in various fields.
2. Identify various synthesis technique of nano materials.
3. Explain different characterization methods of nanostructures.
4. Describe the properties of nanomaterials and their synthesis techniques for electronic applications.
5. Discuss the concept of carbon allotropes in Nano Technology & their applications in electronicand mechanical applications.

OPTIMIZATION TECHNIQUES((OPEN ELECTIVE I))
SITE 21 II M.Tech. III Semester CAD/CAM

1. Apply the theory of optimization methods and algorithms to develop and for solvingvarious types of optimization problems
2. Go in research by applying optimization techniques in problems of Engineering andTechnology
3. Solve the mathematical results and numerical techniques of optimization theory toconcrete Engineering problems by using computer software

PRODUCT DESIGN AND MANUFACTURING((OPEN ELECTIVE I))

SITE 21 II M.Tech. III Semester CAD/CAM
1. Understand the product design and development process. 2. Apply creative thinking skills for idea generation. 3. Translate conceptual ideas into products. 4. Present ideas using various types of models. 5. Learned the art of management for Developing and Launching new products.

SITE 18 Course Outcomes

M.Tech- Computer Science Engineering

Course Outcomes for First Year First Semester Course	
COURSE CODE : 18CSCS101	
COURSE TITLE: Mathematical Foundations of Computer Science	
CO-1	To apply the basic rules and theorems of probability theory such as Baye's Theorem, to determineprobabilities that help to solve engineering problems and to determine the expectation and variance of a random variable from its distribution.
CO-2	Able to perform and analyze of sampling, means, proportions, variances and estimates themaximum likelihood based on population parameters.
CO-3	To learn how to formulate and test hypotheses about sample means, variances and proportionsand to draw conclusions based on the results of statistical tests.
CO-4	Design various ciphers using number theory.
CO-5	Apply graph theory for real time problems like network routing problem
Course Code: 18CMMAT1020	
Course Title: Advanced Data Structures & Algorithms	
CO-1	Ability to write and analyze algorithms for algorithm correctness and efficiency
CO-2	Master a variety of advanced abstract data type (ADT) and data structures and theirImplementation
CO-3	Demonstrate various searching, sorting and hash techniques and be able to apply and solveproblems of real life
CO-4	Design and implement variety of data structures including linked lists, binary trees, heaps, graphsand search trees
CO-5	Ability to compare various search trees and find solutions for IT related problems
Course Code: 18CMEET1030	
Course Title: Big Data Analytics	
CO-1	Illustrate on big data and its use cases from selected business domains.
CO-2	Interpret and summarize on NoSQL,Cassandra
CO-3	Analyze the HADOOP and Map Reduce technologies associated with big data analytics and explore on Big Data applications Using Hive.
CO-4	Make use of Apache Spark, RDDs etc.to work with datasets.
CO-5	Assess real time processing with Spark Streaming.
COURSE CODE: 18CMCST1040	
COURSE TITLE: Digital Image Processing	
CO-1	Demonstrate the components of image processing.
CO-2	Explain various filtration techniques.
CO-3	Apply image compression techniques.
CO-4	Discuss the concepts of wavelet transforms.
CO-5	Analyze the concept of morphological image processing.
COURSE CODE: 18CMMEL1050	
COURSE TITLE: Advanced Operating Systems	
CO-1	Illustrate on the fundamental concepts of distributed operating systems, its architecture anddistributed mutual exclusion.
CO-2	Analyze on deadlock detection algorithms and agreement protocols.

CO-3	Make use of algorithms for implementing DSM and its scheduling.
CO-4	Apply protection and security in distributed operating systems.
CO-5	Elaborate on concurrency control mechanisms in distributed database systems
COURSE CODE: 18CMEGL1050	
COURSE TITLE: ADVANCED COMPUTER NETWORKS	
CO-1	Illustrate reference models with layers, protocols and interfaces.
CO-2	Describe the routing algorithms, Subnetting and Addressing of IPV4 and IPV6.
CO-3	Describe and Analysis of basic protocols of computer networks, and how they can be usedto assist in network design and implementation
CO-4	Describe the concepts Wireless LANS, WIMAX, IEEE802.11, Cellular telephony and Satellite networks
CO-5	Describe the emerging trends in networks-MANETS and WSN.
COURSE CODE: 18CMCSL1080	
COURSE TITLE: Internet of Things	
CO-1	Summarize on the term' internet of things 'in different contexts.
CO-2	Analyze various protocols for IoT.
CO-3	Design a PoC of an IoT system using Rasperry Pi/ Arduino
CO-4	Apply data analytics and use cloud offerings related to IoT.
CO-5	Analyze applications of IoT in real time scenario
COURSE CODE: 18CMEEL1070	
COURSE TITLE: Object Oriented Software Engineering	
CO-1	Apply the Object Oriented Software-Development Process to design software
CO-2	Analyze and Specify software requirements through a SRS documents.
CO-3	Design and Plan software solutions to problems using an object-oriented strategy.
CO- 4	Model the object oriented software systems using Unified Modeling Language (UML)
CO- 5	Estimate the cost of constructing object oriented software.
COURSE CODE:18CMMAT2010	
COURSE TITLE: RESEARCH METHODOLOGY AND IPR	
CO- 1	Understand the research problem and research process.
CO- 2	Understand research ethics .
CO- 3	Prepare a well-structured research paper and scientific presentations
CO-4	Explore on various IPR components and process of filing.
CO- 5	Understand the adequate knowledge on patent and rights
COURSE CODE : 18CSPHT2020	
COURSE TITLE: Advanced Data Structures& Algorithms Lab	
CO-1	Identify classes, objects ,members of a class and relationships among them needed for a specific problem.
CO-2	Examine algorithms performance using Prior analysis and asymptotic notations.
CO-3	Organize and apply to solve the complex problems using advanced data structures (like arrays, stacks, queues, linked lists, graphs and trees.)
CO-4	Apply and analyze functions of Dictionary

COURSE CODE 18CMCHT1030	
COURSE TITLE: Advanced Computing Lab	
CO-1	The student should have hands on experience in using various sensors like temperature, humidity, smoke, light, etc. and should be able to use control web camera, network, andrelays connected to the Pi.
CO-2	Development and uses of IoT technology in Societal and Industrial Applications
CO-3	Skills to undertake high quality academic and industrial research in Sensors and IoT
CO-4	To classify Real World IoT Design Constraints, Industrial Automation in IoT
Course Outcomes for First Year Second Semester Course	
COURSE CODE : 18CMCST2040	
COURSE TITLE : Machine Learning	
CO-1	Domain Knowledge for Productive use of Machine Learning and Diversity of Data.
CO-2	Demonstrate on Supervised and Computational Learning
CO-3	Analyze on Statistics in learning techniques and Logistic
CO-4	RegressionIllustrateonSupportVectorMachinesandPerceptronAlgorithm
CO-5	Design a Multi layer Perceptron Networks and classification of decision tree
COURSE CODE : 18CSCST2050	
COURSE TITLE : Mean Stack Technologies	
CO-1	Identify the Basic Concepts of Web & Markup Languages.
CO-2	Develop web Applications using Scripting Languages & Frameworks.
CO-3	Make use of Express JS and Node JS frameworks
CO-4	Illustrate the uses of web services concepts like restful, reactjs.
CO-5	Adapt to Deployment Techniques & Working with cloud platform.
COURSE CODE : 18CSPHL2060	
COURSE TITLE : Advanced Databases and Mining	
CO-1	Analyze on normalization techniques.
CO-2	Elaborate on concurrency control techniques and query optimization.
CO-3	Summarize the concepts of data mining, data warehousing and data preprocessing strategies.
CO-4	Apply data mining algorithms.
CO-5	Assess various classification & cluster techniques.
COURSE CODE : 18CMCHL2070	
COURSE TITLE : AdHoc & Sensor Networks	
CO-1	Explain the Fundamental Concepts and applications of adhoc and wireless sensor networks
CO-2	Discuss the MAC protocol issues of adhoc networks
CO-3	Enumerate the concept of routing protocols for ad hoc wireless networks with respect to TCPdesign issues
CO-4	Analyze & Specify the concepts of network architecture and MAC layer protocol for WSN
CO-5	Discuss the WSN routing issues by considering QoS measurements
COURSE CODE : 18CMEEL2070	
COURSE TITLE : Soft Computing	
CO-1	Elaborate fuzzy logic and reasoning to handle un certainty in engineering problems.

CO-2	Make use of genetic algorithms to combinatorial optimization problems.
CO-3	Distinguish artificial intelligence techniques, including search heuristics, knowledge representation,planning and reasoning.
CO-4	Formulate and apply the principles of self-adopting and self organizing neuro fuzzy inferencesystems.
CO-5	Evaluate and compare solutions by various soft computing approaches for a given problem
COURSE CODE : 18CMMSN2080	
COURSE TITLE : Cloud Computing	
CO-1	Interpret the key dimensions of the challenge of Cloud Computing.
CO-2	Examine the economics, financial, and technological implications for selecting cloud computingfor own organization.
CO-3	Assessing the financial, technological, and organizational capacity of employer's for activelyinitiating and installing cloud-based applications.
CO-4	Evaluate own organizations' needs for capacity building and training in cloud computing-related ITareas.
CO-5	To Illustrate Virtualization for Data-Center Automation.
Course Code:18CMMAT3010	
Course Title: Principles of Computer Security	
CO-1	Describe the key security requirements of confidentiality, integrity, and availability, types of security threats and attacks and summarize the functional requirements for computer security.
CO-2	Explain the basic operation of symmetric block encryption algorithms, use of secure hashfunctions for message authentication, digital signature mechanism.
CO-3	Discuss the issues involved and the approaches for user authentication and explain how
	access control fits into the broader context that includes authentication, authorization, andaudit.
CO-4	Explain the basic concept of a denial-of-service attack, nature of flooding attacks, distributeddenial-of-service attacks and describe how computer security vulnerabilities are a result of poor programming practices.
CO-5	List the steps used to secure the base operating system, specific aspects of securing Unix/Linux systems, Windows systems, and security in virtualized systems and describe thesecurity threats and counter measures for wireless networks.
Course Code: 18CSECT3020	
Course Title: High Performance Computing	
CO-1	Design, formulate, solve and implement high performance versions of standard single threaded algorithms.
CO-2	Demonstrate the architectural features in the GPU and MIC hardware accelerators.
CO-3	Design programs to extract maximum performance in a multicore, shared memory executionenvironment processor.
CO-4	Analyze Symmetric and Distributed architectures.
CO-5	Develop and deploy large scale parallel programs on tightly coupled parallel systems using themessage passing paradigm.
Course Code: 18CSCST3030	
Course Title: Machine Learning with Python Lab	
CO-1	Implement procedures for the machine learning algorithms
CO-2	Design Python programs for various Learning algorithms
CO-3	Apply appropriate datasets to the Machine Learning algorithms
CO-4	Identify and apply Machine Learning algorithms to solve real world problems
Course Code: 18CSCST3040	

Course Title: MEAN Stack Technologies Lab	
CO-1	Identify the Basic Concepts of Web & Markup Languages.
CO-2	Develop web Applications using Scripting Languages & Frameworks inheritance, packages, Enumeration, and various keywords
CO-3	Creating & Running Applications using JSP libraries.
CO-4	Creating Our First Controller Working with and Displaying in Angular Js and Nested Forms with ng-form.
CO-5	Working with the Files in React JS and Constructing Elements with Data
Course Outcomes for Second Year First Semester Course	
Course Code: 18CSECL3060	
Course Title: Deep Learning	
CO-1	Demonstrate the basic concepts fundamental learning techniques and layers.
CO-2	Discuss the Neural Network training, various random models**.**
CO-3	Explain different types of deep learning network models.
CO-4	Classify the Probabilistic Neural Networks.
CO-5	Implement tools on Deep Learning techniques
Course Code: 18CSCSL3070	
Course Title: Social Network Analysis	
CO-1	Demonstrate social network analysis and measures.
CO-2	Analyze random graph models and navigate social networks data
CO-3	Apply the network topology and Visualization tools.
CO-4	Analyze the experiment with small world models and clustering models.
CO-5	Compare the application driven virtual communities from social network Structure.

SITE 21 Course Outcomes

M.Tech- Computer Science Engineering

Course Outcomes for First Year First Semester Course	
COURSE CODE : 21CSCS101	
COURSE TITLE: Mathematical Foundations of Computer Science	
CO-1	To apply the basic rules and theorems of probability theory such as Baye's Theorem, to determineprobabilities that help to solve engineering problems and to determine the expectation and variance of a random variable from its distribution.
CO-2	Able to perform and analyze of sampling, means, proportions, variances and estimates themaximum likelihood based on population parameters.
CO-3	To learn how to formulate and test hypotheses about sample means, variances and proportionsand to draw conclusions based on the results of statistical tests.
CO-4	Design various ciphers using number theory.
CO-5	Apply graph theory for real time problems like network routing problem
Course Code: 21CMMAT1020	
Course Title: Advanced Data Structures & Algorithms	
CO-1	Ability to write and analyze algorithms for algorithm correctness and efficiency
CO-2	Master a variety of advanced abstract data type (ADT) and data structures and theirImplementation
CO-3	Demonstrate various searching, sorting and hash techniques and be able to apply and solveproblems of real life
CO-4	Design and implement variety of data structures including linked lists, binary trees, heaps, graphsand search trees
CO-5	Ability to compare various search trees and find solutions for IT related problems
Course Code: 21CMEET1030	
Course Title: Big Data Analytics	
CO-1	Illustrate on big data and its use cases from selected business domains.
CO-2	Interpret and summarize on NoSQL,Cassandra
CO-3	Analyze the HADOOP and Map Reduce technologies associated with big data analytics and explore on Big Data applications Using Hive.
CO-4	Make use of Apache Spark, RDDs etc.to work with datasets.
CO-5	Assess real time processing with Spark Streaming.
COURSE CODE: 21CMCST1040	
COURSE TITLE: Digital Image Processing	
CO-1	Demonstrate the components of image processing.
CO-2	Explain various filtration techniques.
CO-3	Apply image compression techniques.
CO-4	Discuss the concepts of wavelet transforms.
CO-5	Analyze the concept of morphological image processing.
COURSE CODE: 21CMMEL1050	
COURSE TITLE: Advanced Operating Systems	

CO-1	Illustrate on the fundamental concepts of distributed operating systems, its architecture anddistributed mutual exclusion.
CO-2	Analyze on deadlock detection algorithms and agreement protocols.
CO-3	Make use of algorithms for implementing DSM and its scheduling.
CO-4	Apply protection and security in distributed operating systems.
CO-5	Elaborate on concurrency control mechanisms in distributed database systems
COURSE CODE: 21CMEGL1050	
COURSE TITLE: ADVANCED COMPUTER NETWORKS	
CO-1	Illustrate reference models with layers, protocols and interfaces.
CO-2	Describe the routing algorithms, Subnetting and Addressing of IPV4 and IPV6.
CO-3	Describe and Analysis of basic protocols of computer networks, and how they can be usedto assist in network design and implementation
CO-4	Describe the concepts Wireless LANS, WIMAX, IEEE802.11, Cellular telephony and Satellite networks
CO-5	Describe the emerging trends in networks-MANETS and WSN.
COURSE CODE: 21CMCSL1080	
COURSE TITLE: Internet of Things	
CO-1	Summarize on the term' internet of things 'in different contexts.
CO-2	Analyze various protocols for IoT.
CO-3	Design a PoC of an IoT system using Rasperry Pi/ Arduino
CO-4	Apply data analytics and use cloud offerings related to IoT.
CO-5	Analyze applications of IoT in real time scenario
COURSE CODE: 21CMEEL1070	
COURSE TITLE: Object Oriented Software Engineering	
CO-1	Apply the Object Oriented Software-Development Process to design software
CO-2	Analyze and Specify software requirements through a SRS documents.
CO-3	Design and Plan software solutions to problems using an object-oriented strategy.
CO- 4	Model the object oriented software systems using Unified Modeling Language (UML)
CO- 5	Estimate the cost of constructing object oriented software.
COURSE CODE:21CMMAT2010	
COURSE TITLE: RESEARCH METHODOLOGY AND IPR	
CO- 1	Understand the research problem and research process.
CO- 2	Understand research ethics .
CO- 3	Prepare a well-structured research paper and scientific presentations
CO-4	Explore on various IPR components and process of filing.
CO- 5	Understand the adequate knowledge on patent and rights
COURSE CODE : 21CSPHT2020	
COURSE TITLE: Advanced Data Structures& Algorithms Lab	
CO-1	Identify classes, objects ,members of a class and relationships among them needed for a specific problem.
CO-2	Examine algorithms performance using Prior analysis and asymptotic notations.

CO-3	Organize and apply to solve the complex problems using advanced data structures (like arrays, stacks, queues, linked lists, graphs and trees.)
CO-4	Apply and analyze functions of Dictionary
COURSE CODE 21CMCHT1030	
COURSE TITLE: Advanced Computing Lab	
CO-1	The student should have hands on experience in using various sensors like temperature, humidity, smoke, light, etc. and should be able to use control web camera, network, andrelays connected to the Pi.
CO-2	Development and uses of IoT technology in Societal and Industrial Applications
CO-3	Skills to undertake high quality academic and industrial research in Sensors and IoT
CO-4	To classify Real World IoT Design Constraints, Industrial Automation in IoT
Course Outcomes for First Year Second Semester Course	
COURSE CODE : 21CMCST2040	
COURSE TITLE : Machine Learning	
CO-1	Domain Knowledge for Productive use of Machine Learning and Diversity of Data.
CO-2	Demonstrate on Supervised and Computational Learning
CO-3	Analyze on Statistics in learning techniques and Logistic
CO-4	RegressionIllustrateonSupportVectorMachinesandPerceptronAlgorithm
CO-5	Design a Multi layer Perceptron Networks and classification of decision tree
COURSE CODE : 21CSCST2050	
COURSE TITLE : Mean Stack Technologies	
CO-1	Identify the Basic Concepts of Web & Markup Languages.
CO-2	Develop web Applications using Scripting Languages & Frameworks.
CO-3	Make use of Express JS and Node JS frameworks
CO-4	Illustrate the uses of web services concepts like restful, reactjs.
CO-5	Adapt to Deployment Techniques & Working with cloud platform.
COURSE CODE : 21CSPHL2060	
COURSE TITLE : Advanced Databases and Mining	
CO-1	Analyze on normalization techniques.
CO-2	Elaborate on concurrency control techniques and query optimization.
CO-3	Summarize the concepts of data mining, data warehousing and data preprocessing strategies.
CO-4	Apply data mining algorithms.
CO-5	Assess various classification & cluster techniques.
COURSE CODE : 21CMCHL2070	
COURSE TITLE : AdHoc & Sensor Networks	
CO-1	Explain the Fundamental Concepts and applications of adhoc and wireless sensor networks
CO-2	Discuss the MAC protocol issues of adhoc networks
CO-3	Enumerate the concept of routing protocols for ad hoc wireless networks with respect to TCPdesign issues
CO-4	Analyze & Specify the concepts of network architecture and MAC layer protocol for WSN
CO-5	Discuss the WSN routing issues by considering QoS measurements
COURSE CODE : 21CMEEL2070	

COURSE TITLE : Soft Computing	
CO-1	Elaborate fuzzy logic and reasoning to handle un certainty in engineering problems.
CO-2	Make use of genetic algorithms to combinatorial optimization problems.
CO-3	Distinguish artificial intelligence techniques, including search heuristics, knowledge representation,planning and reasoning.
CO-4	Formulate and apply the principles of self-adopting and self organizing neuro fuzzy inferencesystems.
CO-5	Evaluate and compare solutions by various soft computing approaches for a given problem
COURSE CODE : 21CMMSN2080	
COURSE TITLE : Cloud Computing	
CO-1	Interpret the key dimensions of the challenge of Cloud Computing.
CO-2	Examine the economics, financial, and technological implications for selecting cloud computingfor own organization.
CO-3	Assessing the financial, technological, and organizational capacity of employer's for activelyinitiating and installing cloud-based applications.
CO-4	Evaluate own organizations' needs for capacity building and training in cloud computing-related ITareas.
CO-5	To Illustrate Virtualization for Data-Center Automation.
Course Code:21CMMAT3010	
Course Title: Principles of Computer Security	
CO-1	Describe the key security requirements of confidentiality, integrity, and availability, types of security threats and attacks and summarize the functional requirements for computer security.
CO-2	Explain the basic operation of symmetric block encryption algorithms, use of secure hashfunctions for message authentication, digital signature mechanism.
CO-3	Discuss the issues involved and the approaches for user authentication and explain how
	access control fits into the broader context that includes authentication, authorization, andaudit.
CO-4	Explain the basic concept of a denial-of-service attack, nature of flooding attacks, distributeddenial-of-service attacks and describe how computer security vulnerabilities are a result of poor programming practices.
CO-5	List the steps used to secure the base operating system, specific aspects of securing Unix/Linux systems, Windows systems, and security in virtualized systems and describe thesecurity threats and counter measures for wireless networks.
Course Code: 21CSECT3020	
Course Title: High Performance Computing	
CO-1	Design, formulate, solve and implement high performance versions of standard single threaded algorithms.
CO-2	Demonstrate the architectural features in the GPU and MIC hardware accelerators.
CO-3	Design programs to extract maximum performance in a multicore, shared memory executionenvironment processor.
CO-4	Analyze Symmetric and Distributed architectures.
CO-5	Develop and deploy large scale parallel programs on tightly coupled parallel systems using themessage passing paradigm.
Course Code: 21CSCST3030	
Course Title: Machine Learning with Python Lab	
CO-1	Implement procedures for the machine learning algorithms
CO-2	Design Python programs for various Learning algorithms
CO-3	Apply appropriate datasets to the Machine Learning algorithms

CO-4	Identify and apply Machine Learning algorithms to solve real world problems
Course Code: 21CSCST3040	
Course Title: MEAN Stack Technologies Lab	
CO-1	Identify the Basic Concepts of Web & Markup Languages.
CO-2	Develop web Applications using Scripting Languages & Frameworks inheritance, packages, Enumeration, and various keywords
CO-3	Creating & Running Applications using JSP libraries.
CO-4	Creating Our First Controller Working with and Displaying in Angular Js and Nested Forms with ng-form.
CO-5	Working with the Files in React JS and Constructing Elements with Data
Course Outcomes for Second Year First Semester Course	
Course Code: 21CSECL3060	
Course Title: Deep Learning	
CO-1	Demonstrate the basic concepts fundamental learning techniques and layers.
CO-2	Discuss the Neural Network training, various random models**.**
CO-3	Explain different types of deep learning network models.
CO-4	Classify the Probabilistic Neural Networks.
CO-5	Implement tools on Deep Learning techniques
Course Code: 21CSCSL3070	
Course Title: Social Network Analysis	
CO-1	Demonstrate social network analysis and measures.
CO-2	Analyze random graph models and navigate social networks data
CO-3	Apply the network topology and Visualization tools.
CO-4	Analyze the experiment with small world models and clustering models.
CO-5	Compare the application driven virtual communities from social network Structure.

SITE 18 Regulations
M. Tech.-VLSI and Embedded System

Course Outcomes for First Year First Semester Course	
Course Code: 18ECVE101	
Course Title: PROGRAMMING CONCEPTS USING VERILOG HDL	
CO-1	Understand the basic design elements and requirements for Verilog HDL.
CO-2	Analyze the comparison among logic level and gate-level implementation of thedigital circuits using Verilog.
CO-3	Understand the behavioral concepts of Verilog using statements and constructs.
CO-4	Understand the switch-level modeling of basic logic circuits.
CO-5	Design the sequential circuits using Verilog using different techniques and testing thedesigns using industry-standard verification methods
Course Code: 18ECVE102	
Course Title: CMOS ANALOG IC DESIGN	
CO-1	Understand the basic properties of MOS switches and sample/hold architecture.
CO-2	Get the basics of data conversion circuits' building blocks and amplifiers.
CO-3	Understand the precision and calibration procedures for ADC and DAC circuits.
CO-4	Get the basic architectures for ADC and DAC circuits and differentperformancemetrics related to them.
CO-5	Understanding the concepts of modulators and noise shaping techniques.
Course Code: 18ECVE103	
Course Title: IC FABRICATION TECHNOLOGY	
CO-1	Understand the steps of preparing semiconductor material using chemicalprocessing.
CO-2	Get the basics of lithography and etching concepts and related equipment
CO-3	Analyze the statistical behaviour of semiconductor material during deposition anddiffusion.
CO-4	Understand various MOS technologies for IC fabrication.
CO-5	Get the basics of assembly and packaging types for IC fabrication.
Course Code: 18ECVE104A	
Course Title: CPLD AND FPGA ARCHITECTURES AND APPLICATIONS	
CO-1	Understand the fundamentals of programmable logic and CPLD.
CO-2	Get the basics of FPGA architectures from industry perspective.
CO-3	Analyze the sequential circuit design using FSMs and various properties of FSMdesign.
CO-4	Understand the system level design for state machine implementation.
CO-5	Get the basics of various industry standard tools for FPGA and ASIC design.
Course Code: 18ECVE104B	
Course Title: DIGITAL SYSTEM SYNTHESIS AND VERIFICATION	
CO-1	Understand the concepts of Verilog programming language and test benchdefinition.
CO-2	Get the advanced features of Verilog programming and synthesis approachusingVerilog.

CO-3	Understand the basics of System Verilog programming for circuit verification
CO-4	Understand the object oriented analysis approach of System Verilog and itsproperties.
CO-5	Get the advanced features of System Verilog programming.
Course Code: 18ECVE104C	
Course Title: ADVANCED DIGITAL DESIGN	
CO-1	Understand the concepts of synchronous sequential circuit design usingstate
CO-2	Understand the asynchronous sequential circuit design methods.
CO-3	Understand the concepts of fault diagnosis and testability algorithms.
CO-4	Understand the synchronous design approach using programmable devices suchasFPGA.
CO-5	Get the basics of hardware modelling using Verilog and System Verilog
Course Code: 18ECVE105	
Course Title: PRINCIPLES OF EMBEDDED SYSTEMS	
CO-1	Understand the fundamentals of Embedded systems.
CO-2	Understand the concepts of General purpose processors and its applications.
CO-3	Get the concepts of embedded systems peripheral interfacing process
CO-4	Analysis the different memories and bus architecture used in embedded systems
CO-5	Able to design of small scale embedded systems
Course Code: 18ECVE106A	
Course Title: MICROCONTROLLERS FOR EMBEDDED SYSTEM DESIGN	
CO-1	Understand the fundamentals of Embedded systems design
CO-2	Understand the concepts of 8051 microcontroller architecture and interfacing.
CO-3	Describe the concepts of object oriented programming tools.
CO-4	Analysis the different SoC architectures.
CO-5	Understand the interrupt handling and device drivers concepts
Course Code: 18ECVE106B	
Course Title EMBEDDED AND REAL TIME SYSTEMS	
CO-1	Understand the concepts of advanced Embedded processors
CO-2	Understand the fundamental design tools for embedded computing
CO-3	Get the concepts of operating systems.
CO-4	Able to analyze the system design techniques.
CO-5	Able to demonstrate the small scale embedded systems operation and applications.
Course Code: 18ECVE106C	
Course Title: NETWORK SECURITY AND CRYPTOGRAPHY	
CO-1	Understand the concepts of Network attacks and security services
CO-2	Able to analyse different encryption algorithms

CO-3	Understand the concepts of Cryptography principles
CO-4	Get the knowledge on Authentication protocols and digital signature.
CO-5	Describes the different web security applications and requirements
Course Code: 18ECVE151	
Course Title: DIGITAL VLSI AND EMBEDDED SYSTEM DESIGN LAB	
CO-1	Understand the concepts of digital design, simulation and synthesis using Verilogand modern VLSI EDA tools.
CO-2	Understand the concepts of implementing example applications on ARM-CORTEX
Course Outcomes for First Year Second Semester Course	
Course Code: 18ECVE201	
Course Title: LOW POWER VLSI DESIGN	
CO-1	Understand the fundamentals of power parameters in CMOS logic.
CO-2	Understand the methods of power optimization at various levels of design flow.
CO-3	Get the concepts of power optimization in memories specifically atinterconnect andlayout level.
CO-4	Understand the power estimation techniques using probabilistic and other methods.
CO-5	Get the concepts of power optimization at synthesis stage.
Course Code: 18ECVE202	
Course Title: VLSI TESTING AND TESTABILITY	
CO-1	Understand the fundamentals of IC testing and basic terminology.
CO-2	Get the methods of generating test patterns for testing of IC.
CO-3	Get the various techniques and methods of IC testing.
CO-4	Understand the concepts of analog and digital IC testing.
CO-5	Understand the fundamentals of memory testing and various techniques.
Course Code: 18ECVE203	
Course Title: VLSI DESIGN AUTOMATION	
CO-1	Understand the fundamentals of graph theory for algorithmic representation ofICdesign flow.
CO-2	Get the basics of design rules for layout drawing of IC design.
CO-3	Understand the methods of performing floorplanning and routing algorithms inICdesign.
CO-4	Understand the concepts of simulation at various stages of IC design.
CO-5	Get the information of advanced techniques for synthesis in IC design flow.
Course Code: 18ECVE204A	
Course Title: FUNCTIONAL VERIFICATION USING HARDWARE VERIFICATION	
CO-1	Understand the fundamentals of verification techniques and tools required forhardware verification.
CO-2	Get the basics of high-level modelling and object-oriented programming for hardware verification
CO-3	Understand the techniques for stimulus generation and monitoring the output ofverification methods.
CO-4	Understand the methods of test bench creating and simulation management oftestbench and design block together.

CO-5	Get the information of UVM methods in hardware verification
Course Code: 18ECVE204B	
Course Title: SYSTEM-ON-CHIP DESIGN	
CO-1	Understand the logic gates realization and interconnect strategy for SoC design.
CO-2	Get the combination logic networks and related delay and power optimizationmethods for SoC design.
CO-3	Get the sequential logic networks and related delay and power optimizationmethodsfor SoC design.
CO-4	Understand the sub-system design using example combination and sequentiallogiccircuits.
CO-5	Get the fundamentals of floorplanning methods and I/O architecture for SoC design
Course Code: 18ECVE204C	
Course Title CMOS MIXED SIGNAL CIRCUIT DESIGN	
CO-1	Understand the concepts of switched capacitor circuits operation and analysis.
CO-2	Get the basics of PLL and its applications.
CO-3	Understand the fundamentals of data converters and specifications of basic D/Aconversion.
CO-4	Understand the types of A/D converters using mixed signal circuit design.
CO-5	Get the fundamentals of oversampling converters and noise shaping modulators.
Course Code: 18ECVE205	
Course Title :HARDWARE SOFTWARE CO-DESIGN	
CO-1	Understand the concepts of co-design issues
CO-2	Able to describe different Prototyping techniques
CO-3	Get the knowledge on embedded processor architecture
CO-4	Understand the design specification and verification tools.
CO-5	Analyse different languages for system level specification.
Course Code: 18ECVE206A	
Course Title: EMBEDDED SYSTEM DESIGN	
CO-1	Understand the concepts of current technologies if embedded systems design
CO-2	Demonstrate the different types of embedded hardware modules
CO-3	Get the knowledge on embedded software concepts
CO-4	Analyse the embedded design and implementation tools.
CO-5	Able to describes the processor design approachs.
Course Code: 18ECVE206B	
Course Title: INTERNET OF THINGS	
CO-1	Understand the basic concepts of Internet of Things.
CO-2	Analyse the different technologies for Internet of Things

CO-3	Get the knowledge on IPv6 concepts
CO-4	Able to demonstrates the IoT applications
CO-5	Get the knowledge on IoT data analytics.
Course Code: 18ECVE206C	
Course Title: SENSORS AND ACTUATORS	
CO-1	Understand the basic concepts of electromechanical sensors.
CO-2	Able to determine different types of thermal and magnetic sensors.
CO-3	Describes the concepts of X-ray and Nuclear Radiation sensors
CO-4	Get the knowledge on smart sensors for automation and automobile applications
CO-5	Able to describe different types of actuators and its application.
Course Code: 18ECVE206D	
Course Title: MICRO ELECTRO MECHANICAL SYSTEM (MEMS) DESIGN	
CO-1	Understand the basic concepts of MEM devices.
CO-2	Able to review the different mechanical and electrical concepts for MEM's
CO-3	Able to analyse different types of MEM's
CO-4	Get the knowledge on MEM structures and components
CO-5	Able to demonstrate the concepts of MEM technologies.
Course Code: 18ECVE251	
Course Title: ANALOG VLSI DESIGN LAB	
CO-1	Design CMOS logic circuits using Virtuso tool.
CO-2	Understand the concepts of lambda calculation for MOS transistors.
CO-3	Design a variety of current mirrors circuits.
CO-4	Design a variety of current sink circuits.
CO-5	Design differential amplifier and measure all the related circuit parameters.

SITE 21 Regulations

M. Tech.-VLSI and Embedded Systems

Course Outcomes for First Year First Semester Course	
Course Code: 21ECVE101	
Course Title: PRINCIPLES OF EMBEDDED SYSTEMS	
CO-1	Understand the fundamentals of embedded systems.
CO-2	Understand the concepts of general purpose processors and its applications.
CO-3	Get the concepts of embedded systems peripheral interfacing process
CO-4	Analysis the different memories and bus architecture used in embedded systems
CO-5	Able to design of small scale embedded systems
Course Code: 21ECVE102	
Course Title: CMOS ANALOG IC DESIGN	
CO-1	Understand the basic properties of MOS switches and sample/hold architecture.
CO-2	Get the basics of data conversion circuits' building blocks and amplifiers
CO-3	Understand the precision and calibration procedures for ADC and DAC circuits.
CO-4	Get the basic architectures for ADC and DAC circuits and different performancemetrics related to them.
CO-5	Understanding the concepts of modulators and noise shaping techniques
Course Code: 21ECVE103A	
Course Title: PHYSICAL DESIGN AUTOMATION	
CO-1	Understand the fundamentals of graph theory for algorithmic representationof ICdesign flow.
CO-2	Get the basics of design rules for layout drawing of IC design.
CO-3	Understand the methods of performing floorplanning and routing algorithms inIC design
CO-4	Understand the concepts of simulation at various stages of IC design
CO-5	Get the information of advanced techniques for synthesis in IC design flow.
Course Code: 21ECVE103B	
Course Title: DIGITAL SYSTEM SYNTHESIS AND VERIFICATION	
CO-1	Understand the concepts of Verilog programming language and test benchdefinition.
CO-2	Get the advanced features of Verilog programming and synthesis approach usingVerilog.
CO-3	Understand the basics of System Verilog programming for circuit verification.
CO-4	Understand the object oriented analysis approach of System Verilog and its properties.
CO-5	Get the advanced features of System Verilog programming.

Course Code: 21ECVE103C	
Course Title: ADVANCED DIGITAL DESIGN	
CO-1	Understand the concepts of synchronous sequential circuit design using statemachines and ASM chart.
CO-2	Understand the asynchronous sequential circuit design methods
CO-3	Understand the concepts of fault diagnosis and testability algorithms
CO-4	Understand the synchronous design approach using programmable devices suchas FPGA
CO-5	Get the basics of hardware modelling using Verilog and System Verilog.
Course Code: 21ECVE104A	
Course Title: MICROCONTROLLERS FOR EMBEDDED SYSTEM DESIGN	
CO-1	Understand the fundamentals of Embedded systems design
CO-2	Understand the concepts of 8051 microcontroller architecture and interfacing.
CO-3	Describe the concepts of object oriented programming tools
CO-4	Analysis the different SoC architectures
CO-5	Understand the interrupt handling and device drivers concepts.
Course Code: 21ECVE104B	
Course Title: EMBEDDED AND REAL TIME SYSTEMS	
CO-1	Understand the concepts of advanced Embedded processors
CO-2	Understand the fundamental design tools for embedded computing
CO-3	Get the concepts of operating systems
CO-4	Able to analyze the system design techniques.
CO-5	Able to demonstrate the small scale embedded systems operation and applications
Course Code: 21ECVE104C	
Course Title: NETWORK SECURITY AND CRYPTOGRAPHY	
CO-1	Understand the concepts of Network attacks and security services
CO-2	Able to analyse different encryption algorithms
CO-3	Understand the concepts of Cryptography principles
CO-4	Get the knowledge on Authentication protocols and digital signature
CO-5	Describes the different web security applications and requirements
Course Code: 21ECVE105	
Course Title: RESEARCH METHODOLOGY & IPR	
CO-1	Understand research problem formulation.
CO-2	Analyze research related information
CO-3	Follow research ethics

CO-4	Understand that today‟s world is controlled by Computer, InformationTechnology, but tomorrow world will be ruled by ideas, concept, and creativity
CO-5	Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information aboutIntellectual Property Right to be promoted among students in general & engineering in particular
Course Code: 21ECVE151	
Course Title: ADVANCED VLSI DESIGN LAB I	
CO-1	Understand the concepts of digital design using EDA tools like Cadence, Xillinx,Mentor Graphics.
CO-2	To design the given digital system , simulation and synthesis using Verilog andmodern VLSI EDA tools.
Course Code: 21ECVE152	
Course Title: EMBEDDED SYSTEM LAB	
CO-1	Understand the concepts of embedded systems
CO-2	Understand the concepts of implementing example applications on ARM-CORTEX processor
Course Outcomes for First Year Second Semester Course	
Course Code: 21ECVE201	
Course Title : INTERNET OF THINGS	
CO-1	Understand the basic concepts of Internet of Things.
CO-2	Analyze the different technologies for Internet of Things.
CO-3	Get the knowledge on IPv6 concepts.
CO-4	Able to demonstrates the IoT applications
CO-5	Get the knowledge on IoT data analytics
Course Code: 21ECVE202	
Course Title: VLSI TESTING AND TESTABILITY	
CO-1	Understand the fundamentals of IC testing and basic terminology.
CO-2	Get the methods of generating test patterns for testing of IC
CO-3	Get the various techniques and methods of IC testing.
CO-4	Understand the concepts of analog and digital IC testing
CO-5	Understand the fundamentals of memory testing and various techniques.
Course Code: 21ECVE203A	
Course Title FUNCTIONAL VERIFICATION USINGHARDWARE VERIFICATION LANGUAGES	
CO-1	Understand the fundamentals of verification techniques and tools required for hardware verification.
CO-2	Get the basics of high-level modeling and object-oriented programming forhardware verification.
CO-3	Understand the techniques for stimulus generation and monitoring the output ofverification methods.
CO-4	Understand the methods of test bench creating and simulation management of testbench and design block together.
CO-5	Get the information of UVM methods in hardware verification
Course Code: 21ECVE203B	

Course Title: CMOS MIXED SIGNAL CIRCUIT DESIGN	
CO-1	Understand the concepts of switched capacitor circuits operation and analysis.
CO-2	Get the basics of PLL and its applications.
CO-3	Understand the fundamentals of data converters and specifications of basic D/Aconversion
CO-4	Understand the types of A/D converters using mixed signal circuit design
CO-5	Get the fundamentals of oversampling converters and noise shaping modulators.
Course Code: 21ECVE203C	
Course Title: LOW POWER VLSI DESIGN	
CO-1	Understand the fundamentals of power parameters in CMOS logic.
CO-2	Understand the methods of power optimization at various levels of design flow
CO-3	Get the concepts of power optimization in memories specifically at interconnectand layout level
CO-4	Understand the power estimation techniques using probabilistic and othermethods
CO-5	Get the concepts of power optimization at synthesis stage.
Course Code: 21ECVE204A	
Course Title: EMBEDDED SYSTEM DESIGN	
CO-1	Understand the concepts of current technologies if embedded systems design
CO-2	Demonstrate the different types of embedded hardware modules
CO-3	Get the knowledge on embedded software concepts
CO-4	Analyze the embedded design and implementation tools
CO-5	Able to describes the processor design approaches
Course Code: 21ECVE204B	
Course Title: SENSORS AND ACTUATORS	
CO-1	Understand the basic concepts of electromechanical sensors.
CO-2	Able to determine different types of thermal and magnetic sensors
CO-3	Describes the concepts of X-ray and Nuclear Radiation sensors
CO-4	Get the knowledge on smart sensors for automation and automobile applications
CO-5	Able to describes different types of actuators and its application.
Course Code: 21ECVE204C	
Course Title: MICRO ELECTRO MECHANICAL SYSTEM (MEMS) DESIGN	
CO-1	Understand the basic concepts of MEM devices.
CO-2	Able to review the different mechanical and electrical concepts for MEM's.
CO-3	Able to analyse different types of MEM's.
CO-4	Get the knowledge on MEM structures and components.
CO-5	Able to demonstrate the concepts of MEM technologies.
Course Code21ECVE251	
Course Title: ADVANCED VLSI DESIGN LAB II	

CO-1	Design CMOS logic circuits using MENTOR GRAPHICS tool.
CO-2	Understand the concepts of lambda calculation for MOS transistors.
CO-3	Design a variety of current mirrors circuits.
CO-4	Design a variety of current sink circuits.
CO-5	Design differential amplifier and measure all the related circuit parameters.
Course Code: 21ECVE252	
Course Title: IoT LAB	
CO-1	Separate IoT hype from the reality.
CO-2	Effective usage of IoT deployment for different sectors.
CO-3	Trace the relationship between IoT, cloud services and software agents.
CO-4	Create IoT based applications under in-house expert guidance.
CO-5	Students will become more industry ready.
CO-6	Fill Technology gap between Industry and Institute will be reduced.
Course Outcomes for Second Year First Semester Course	
Course Code: 21ECVE301A	
Course Title: VLSI TECHNOLOGY	
CO-1	Understand the steps of preparing semiconductor material using chemicalprocessing.
CO-2	Get the basics of lithography and etching concepts and related equipment.
CO-3	Analyze the statistical behaviour of semiconductor material during deposition and diffusion
CO-4	Understand various MOS technologies for IC fabrication.
CO-5	Get the basics of assembly and packaging types for IC fabrication
Course Code: 21ECVE301B	
Course Title: CPLD AND FPGA ARCHITECTURES AND APPLICATIONS	
CO-1	Understand the fundamentals of programmable logic and CPLD.
CO-2	Get the basics of FPGA architectures from industry perspective.
CO-3	Analyze the sequential circuit design using FSMs and various properties of FSMdesign.
CO-4	Understand the system level design for state machine implementation.
CO-5	Get the basics of various industry standard tools for FPGA and ASIC desiagn.
Course Code: 21ECVE301C	
Course Title: PROGRAMMING LANGUAGES FOR EMBEDDED SYSTEM	
CO-1	Understand the concepts of programming languages for embedded system design.
CO-2	Write an embedded C application of moderate complexity.
CO-3	Develop embedded C application.
CO-4	Analyze algorithms in C++.
CO-5	Differentiate interpreted languages from compiled languages.

Course Code: 21ECVE302A	
Course Title: OPTIMIZATION TECHNIQUES	
CO-1	Understand importance of optimization
CO-2	Apply basic concepts of mathematics to formulate an optimization problem
CO-3	Analyze various optimization problems.
CO-4	Performance measures for various optimization problems.
CO-5	Apply the suitable optimization problems for different applications
Course Code: 21ECSP302B	
Course Title: MODELLING AND SIMULATION TECHNIQUES	
CO-1	Identify and model discrete systems (deterministic and random).
CO-2	Identify and model discrete signals (deterministic and random).
CO-3	Understand modeling techniques to characterize systems/processes.
CO-4	Understand simulation techniques to characterize systems.
CO-5	Understand simulation techniques to characterize processes
Course Code21ECVE302C	
Course Title: ARTIFICIAL INTELLIGENCE	
CO-1	Understand the concept of Artificial Intelligence.
CO-2	Search techniques and knowledge representation issues.
CO-3	Understanding reasoning.
CO-4	Understand concept of fuzzy logic for artificial intelligence.
CO-5	Understanding game playing and natural language processing.

SITE 18 REGULATIONS

Communication Engineering & Signal Processing

Course Outcomes for First Year First Semester Course	
Course Code: 18ECSP101	
Course Title: Advanced Digital Communication	
CO-1	Understand concepts of various digital modulations and demodulations
CO-2	Analyze and design various channel coding techniques
CO-3	Explain concepts of equalization and code division multiple accessing techniques.
CO-4	Understand multipath fading and techniques to overcome fading.
Course Code: 18ECSP102	
Course Title: Optical Networks	
CO-1	Explain propagation of light and losses inside the fiber
CO-2	Understand the operation of various optical active and passive components
CO-3	Explain system model and various optical networks
CO-4	Understand control management techniques.
Course Code: 18ECSP103	
Course Title: Wireless Communication	
CO-1	Understand the wireless channel environment
CO-2	Explain how diversity technique minimizes the effect of fading
CO-3	Estimate capacity of various channels
CO-4	Understand the concept of MIMO
Course Code: 18ECSP104	
Course Title: Advanced Digital Signal Processing	
CO-1	Understand the concepts of FIR and IIR Filters
CO-2	Understand Multirate digital signal processing principles and its applications
CO-3	Estimate the various spectral components present in the received signal using different spectral estimation methods such as Parametric and Nonparametric
Course Code: 18ECSP105	
Course Title: Statistical Signal Processing	
CO-1	Understand statistical models and characterization for signals
CO-2	Explain various nonparametric methods for estimation
CO-3	Understand filtering techniques like wiener and kalman

Course Code: 18ECSP106A	
Course Title: Multimedia over Communication	
CO-1	Understand statistical multimedia information representation and networks
CO-2	Explain various MPEG standards
CO-3	Understand synchronization and management tchniques
Course Code: 18ECSP106B	
Course Title: Communication System Design using DSP	
CO-1	Introduce communication systems, including algorithms that are particularly suited to DSP implementation.
CO-2	Introduced Software and hardware tools, as well as FIR and IIR digital filters and the FFT.
CO-3	Discusses modulators and demodulators for classical analog modulation methods such as amplitude modulation (AM), doublesideband suppressed-carrier amplitude modulation (DSBSC-AM), single sideband modulation (SSB), and frequency modulation (FM).
CO-4	Explore digital communication methods leading to the implementation of a telephone-line modem.
Course Code: 18ECSP106C	
Course Title: Radar Signal Processing	
CO-1	Understand radar principle and different types of radars
CO-2	Explain how to detect radar signals in noise
CO-3	Understand pulse compression techniques
Course Code: 18ECSP106D	
Course Title : VLSI Design for Signal Processing	
CO-1	Learn several high-level architectural transformations that can be used to design families of architectures for a given algorithm.
CO-2	Deal with high-level algorithm transformations such as strength reduction, look-ahead and relaxed look-ahead.
Course Code: 18ECSP151	
Course Title : Digital Signal Processing Laboratory	
CO-1	Verify generation of various signals and operations on signal.
CO-2	Practically visualize autocorrelation, power spectrum estimation and other concepts in DSP
CO-3	Enhance programming skills in signal processing field.
Course Code: 18ECSP201	
Course Title: Coding Theory and Applications	
CO-1	Compare Block codes such as Linear Block Codes, Cyclic codes etc and Convolutional codes.
CO-2	Detect and correct errors for different data communication and storage systems.
CO-3	Implement different Block code encoders and decoders.
CO-4	Analyze and implement convolutional encoders and decoders.
CO-5	Analyze and apply soft and hard Viterbi algorithm for decoding of convolutional codes.
Course Code: 18ECSP202	

Course Title: Antenna Theory and Design	
CO-1	Understand parameters of antennas
CO-2	Explain the concept linear array and planar array
CO-3	Design antennas using various Antenna Synthesis techniques
CO-4	Understand various computational methods
Course Outcomes for First Year Second Semester Course	
Course Code: 18ECSP203	
Course Title: Image Processing and Machine Vision	
CO-1	An introduction to image analysis and computer vision for undergraduates.
CO-2	An introduction to low-level vision (early processing) techniques such as binary image analysis, filtering, edge detection and texture analysis
CO-3	An introduction to mid-level vision topics such as image segmentation and feature extraction.
CO-4	Application of Image processing techniques to image retrieval, image classification, and object recognition with emphasis on feature extraction and image representations for recognition.
Course Code: 18ECSP204	
Course Title: Adaptive Signal Processing	
CO-1	Meaning of "adaption" in terms of signal processing and geometrical terms.
CO-2	And analyze basic non-recursive adaptive filter, that is, the adaptive linear combiner.
CO-3	Performance or error surface under stationary and non-stationary conditions.
CO-4	LMS algorithms and other types of adaptive algorithms. Understand adaptive modelling and system identification; inverse adaptive modelling, de-convolution and equalization.
Course Code: 18ECSP205	
Course Title: DSP Processors and Architectures	
CO-1	Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT)
CO-2	Various Programmable Digital Signal Processors
CO-3	Interfacing Memory and I/O Peripherals to Programmable DSP Devices
Course Code: 18ECSP206A	
Course Title: EMBEDDED SYSTEM DESIGN	
CO-1	To understand the concepts of Embedded System Design
CO-2	To learn about embedded hardware .

CO-3	To deal with embedded software and understand various concepts of embedded operating systems
CO-4	To Understand the design ,development and testing of embedded systems
CO-5	To familiarize with Embedded System Design-Case Studies.
Course Code: 18ECSP206B	
Course Title: Modern Spectrum Analysis and Estimation	
CO-1	Understand Energy Spectral Density of deterministic signals and Power Spectral Density of random signals
CO-2	Understand various methods for spectrum estimation
CO-3	Explain filter band method and optimum filter method

Course Code: 18ECSP206C	
Course Title : Speech Processing	
CO-1	Familiarize the basic mechanism of speech production and get anvoverview of articulatory and acoustic Phonetics.
CO-2	Learn the basic concepts of methods for speech analysis and parametric representation of speech.
CO-3	Acquire knowledge about various methods used for speech and audio coding.
CO-4	Get an overall picture about various applications of speech and audio processing
Course Code: 18ECSP251	
Course Title : Advanced Communication Laboratory	
CO-1	Verify the performance of various digital modulation schemes in AWGN and Wireless channel
CO-2	Find various losses in optical communication link
CO-3	Verify the properties of various microwave components
CO-4	Design various antennas for the given specifications
CO-5	Analyse different languages for system level specification.

SITE 21 REGULATIONS

M.Tech.-Communication Engineering & Signal Processing

Course Outcomes for First Year First Semester Course	
Course Code: 21ECSP101	
Course Title: ADVANCED DIGITAL SIGNAL PROCESSING	
CO-1	At the completion of this course, the student should have in depth knowledge of processing digital signals.
CO-2	To study about discrete time systems and to learn about FFT algorithms.
CO-3	To study the design techniques for FIR and IIR digital filters
CO-4	To study the finite word length effects in signal processing
CO-5	To study the properties of random signal, Multirate digital signal processing and about QMF filters
Course Code: 21ECSP102	
Course Title: CODING THEORY AND APPLICATIONS	
CO-1	Compare Block codes such as Linear Block Codes, Cyclic codes etc and Convolutional codes.
CO-2	Detect and correct errors for different data communication and storage systems.
CO-3	Implement different Block code encoders and decoders.
CO-4	Analyze and implement convolutional encoders and decoders.
CO-5	Analyze and apply soft and hard Viterbi algorithm for decoding of convolutional codes.
Course Code: 21ECSP103A	
Course Title: DSP Architectures	
CO-1	Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT)
CO-2	Various Programmable Digital Signal Processors
CO-3	Interfacing Memory and I/O Peripherals to Programmable DSP Devices
Course Code: 21ECSP103B	
Course Title: STATISTICAL SIGNAL PROCESSING	
CO-1	Understand statistical models and characterization for signals
CO-2	Explain various nonparametric methods for estimation
CO-3	Understand filtering techniques like wiener and kalman
Course Code: 21ECVE103C	
Course Title: RADAR SIGNAL PROCESSING	
CO-1	Understand radar principle and different types of radars
CO-2	Explain how to detect radar signals in noise

CO-3	Understand pulse compression techniques
Course Code: 21ECSP104A	
Course Title: DIGITAL DATA COMMUNICATIONS	
CO-1	Different modulation techniques to improve the bandwidth and their properties.
CO-2	Networking and different protocol systems.
CO-3	Error estimation and correction, asynchronous and synchronous protocols.
CO-4	Multiplexing techniques, different networking connections and interfacing devices
CO-5	Multiple access techniques and analysis.
Course Code: 21ECSP104B	
Course Title: WIRELESS SENSOR NETWORKS	
CO-1	Different modulation techniques to improve the bandwidth and their properties.
CO-2	Networking and different protocol systems
CO-3	Error estimation and correction, asynchronous and synchronous protocols.
CO-4	Multiplexing techniques, different networking connections and interfacing devices.
CO-5	Multiple access techniques and analysis.
Course Code: 21ECSP104C	
Course Title: MULTI MEDIA OVER COMMUNICATION	
CO-1	Understand statistical multimedia information representation and networks
CO-2	Explain various MPEG standards
CO-3	Understand synchronization and management tchniques
Course Code: 21ECSP105	
Course Title: RESEARCH METHODOLOGY & IPR	
CO-1	Understand research problem formulation.
CO-2	Analyze research related information
CO-3	Follow research ethics
CO-4	Understand that today‟s world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity
CO-5	Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information aboutIntellectual Property Right to be promoted among students in general & engineering in particular
Course Code: 21ECSP151	
Course Title: ADVANCED DIGITAL SIGNAL PROCESSING LABORATORY	
CO-1	Verify generation of various signals and operations on signals

CO-2	Practically visualize autocorrelation, power spectrum estimation and other concepts inDSP
CO-3	Enhance programming skills in signal processing field.
Course Code: 21ECSP152	
Course Title: DATACOMMUNICATIONS LABORATORY	
CO-1	Verify generation of various signals and operations on signals
CO-2	Practically visualize autocorrelation, power spectrum estimation and other concepts inDSP
CO-3	Enhance programming skills in signal processing field.
Course Outcomes for First Year Second Semester Course	
Course Code: 18ECSP201	
Course Title : ANTENNA THEORY AND DESIGN	
CO-1	Understand parameters of antennas
CO-2	Explain the concept linear array and planar array
CO-3	Design antennas using various Antenna Synthesis techniques
CO-4	Understand various computational methods
Course Code: 21ECVE202	
Course Title: IMAGE PROCESSING & MACHINE VISION	
CO-1	An introduction to image analysis and computer vision for undergraduates.
CO-2	An introduction to low-level vision (early processing) techniques such as binaryimage analysis, filtering, edge detection and texture analysis.
CO-3	An introduction to mid-level vision topics such as image segmentation and featureextraction
CO-4	Application of Image processing techniques to image retrieval, image classification,and object recognition with emphasis on feature extraction and image representations for recognition
Course Code: 21ECSP203A	
Course Title : INTERNET OF THINGS(Elective)	
CO-1	The course objective is to make students describe and design the IoT based applications
CO-2	Analyse the different technologies for Internet of Things
CO-3	Get the knowledge on IPv6 concepts
CO-4	Able to demonstrates the IoT application
CO-5	Get the knowledge on IoT data analytics.
Course Code: 21ECSP203B	
Course Title: ADAPTIVE SIGNAL PROCESSING	
CO-1	Meaning of “adaption” in terms of signal processing and geometrical terms.

CO-2	And analyze basic non-recursive adaptive filter, that is, the adaptive linear combiner.
CO-3	Performance or error surface under stationary and non-stationary conditions.
CO-4	LMS algorithms and other types of adaptive algorithms. Understand adaptive modelling and system identification; inverse adaptive modelling, de-convolution and equalization.
Course Code: 21CSP203C	
Course Title: BIO MEDICAL SIGNAL PROCESSING	
CO-1	Meaning of "bio medical" in terms of signal processing and geometrical terms.
CO-2	And analyze basic physiological signal acquiring.
CO-3	Bio medical signal processing.
CO-4	Principal signal component analysis.
Course Code: 21ECSP204A	
Course Title: OPTICAL NETWORKS	
CO-1	Explain propagation of light and losses inside the fiber
CO-2	Understand the operation of various optical active and passive components.
CO-3	Explain system model and various optical networks
CO-4	Understand control management techniques.
Course Code: 21ECSP204B	
Course Title: MODERN SPECTRUM ANALYSIS ESTIMATION	
CO-1	Understand Energy Spectral Density of deterministic signals and Power SpectralDensity of random signals
CO-2	Understand various methods for spectrum estimation
CO-3	Explain filter band method and optimum filter method
Course Code: 21ECSP204C	
Course Title: ELECTROMAGNETIC INTERFERENCE AND ELECTROMAGENTIC COMPATIBILITY	
CO-1	To introduce enough knowledge regarding the Electromagnetic interference/ Electromagnetic compatibility, Its practical experiences and concerns, and various sources both the natural and Nuclear sources of EMI
CO-2	To know the practical experiences due to EMI such as mains power supply, switches and relaysetc and Analyze EM Propagation and Crosstalk
CO-3	To know various methods of the measurements radiated and conducted interference in open area test sites and in chambers.
CO-4	To Learn about the various methods of minimizing the EMI.
CO-5	To know the National/International EMC Standards.
Course Code : 21ECSP251	
Course Title: DIGITAL IMAGE & VIDEO PROCESSING LABORATORY	
CO-1	Understand the concepts of digital image and video signal processing operations

CO-2	Perform image and video segmentation
CO-3	Detect an object in an image/video
Course Code: 21ECSP252	
Course Title: DETECTION AND ESTIMATION THEORY LAB	
CO-1	Understand the concepts of adaptive signal detection with and without noise and comparison of signal estimation techniques
CO-2	Simulate signals and noise
CO-3	Detect signals in the presence of noise
CO-4	Compare various estimation techniques
Course Outcomes for Second Year First Semester Course	
Course Code: 21ECSP301A	
Course Title: SPEECH PROCESSING	
CO-1	Familiarize the basic mechanism of speech production and get an overview ofarticulatory and acoustic Phonetics.
CO-2	Learn the basic concepts of methods for speech analysis and parametricvrepresentation ofspeech.
CO-3	Acquire knowledge about various methods used for speech and audio coding.
CO-4	Get an overall picture about various applications of speech and audio processing.
Course Code: 21ECSP301B	
Course Title: TRANSFORM TECHNIQUES	
CO-1	Familiarize the fourier analysis
CO-2	Learn the basic concepts of transforms and their applications
CO-3	Acquire knowledge about wavelet transforms.
CO-4	Get an overall picture about wavelet packets and lifting
Course Code: 21ECSP301C	
Course Title: PATTERN RECOGNITION AND MACHINE LEARNING	
CO-1	To equip students with basic mathematical and statistical techniques commonly used in pattern recognition.
CO-2	To introduce students to a variety of pattern recognition algorithms
CO-3	Enable students to apply machine learning concepts in real life problems
Course Code: 21ECSP302A	
Course Title: OPTIMIZATION TECHNIQUES	
CO-1	Understand the basics of linear programming.
CO-2	To introduce optimization techniques
CO-3	Enable students to apply optimization methods in real life problems
Course Code: 21ECSP302B	
Course Title: MODELLING AND SIMULATION TECHNIQUES	
CO-1	To equip students with basics of discrete signals and system

CO-2	Know the various modelling techniques and to apply them to different systems algorithms.
CO-3	Enable students to apply simulation techniques to various processes
Course Code: 21ECSP302C	
Course Title: ARTIFICIAL INTELLIGENCE	
CO-1	understanding the concepts of AI techniques knowledge representation issues
CO-2	Search techniques and knowledgerepresentation issues
CO-3	Understand concept of fuzzy logic for artificial intelligence
CO-4	Understanding game playing and natural language processing

SITE 18 Regulation

Masters in Business Administration

PRINCIPLES OF MANAGEMENT
Subject Code: **18MS01T1**
COURSE OUTCOMES: **1.** Students are able to understood the development of management thought **2.** Clearly know the concepts of planning, organizing and their components **3.** Understand the methods and techniques of directing and controlling **4.** Familiar with the various decision making tools **5.** Know the various contemporary issues
MANAGERIAL ECONOMICS
Subject Code: **18MS01T2**
COURSE OUTCOMES: 1. Students are experienced with various economic concepts with reference to business 2. Ability to understand demand and supply concept 3. Familiar with the production function with one variable and two variable inputs 4. Ability to understand various types of cost 5. Students are aware the various market structures and know the various price determination in each market structure
ACCOUNTING FOR MANAGERS
Subject Code: **18MS01T3**
COURSE OUTCOMES: 1. Know the various concepts of Accounting 2. Students are able to understand the procedure for preparation of final accounts 3. Students are understand the various tools for analysing the financial statements 4. Students are proficient with various cost concepts and cost estimation tools 5. Ability to understood the various Cost Accounting techniques and methods
MANAGERIAL COMMUNICATION & SOFT SKILLS
Subject Code: **18MS01T4**
COURSE OUTCOMES: 1. Ability to understand the importance of Business Communication 2. Understand the formal and informal communication 3. Ability to understand various communication styles 4. Familiar with the various business writing skills

5. Familiar with various presentation techniques and types

QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS

Subject Code: **18MS01T5**

COURSE OUTCOMES:

1. Able to understand the importance of Mathematics and Statistical Techniques in Decisions Making
2. Ability to understand the steps involved in decision making
3. Understand the steps involved in constructing Linear Programming Model
4. Familiar with the transportation and assignment models and Game Theory
5. Understand the Project Management techniques.

BUSINESS ENVIRONMENT

Subject Code: **18MS01T6**

COURSE OUTCOMES:

1. Students are learned with the knowledge of business environment.
2. Students are able to gain knowledge regarding fiscal policy, balance of payment, trade policies and consumer protection act-1986
3. Ability to know the various components of Indian Economy
4. Know the overview of Indian Foreign Trade Policy with global perspective.
5. Understand the Legal framework of Government of India

INFORMATION TECHNOLOGY LAB

Subject Code: **18CS01L7**

COURSE OUTCOMES:

1. Familiar with the various software's used by the business world.
2. Know the various Financial Modelling techniques.
3. Understand the importance of various statistical models applied in managerial decision making
4. Familiar with the various data collection and data presentation methods.
5. Understand the various procedures for designing of Mini Projects and other course works.

FINANCIAL MANAGEMENT

Subject Code: **18MS02T1**

COURSE OUTCOMES:

1. Ability to understand the basic concepts of Financial Management
2. Familiar with the various methods to estimate the required rate of return
3. Understand the various phases of Capital Budgeting & familiar with the various project review techniques.
4. Ability to understand the various dividend theories along with their assumptions
5. Know the various factors affecting the Working Capital requirements of business

MARKETING MANAGEMENT

Subject Code: **18MS02T2**

COURSE OUTCOMES:

1. Ability to understand the basic concepts of Marketing & adhere the Indian Marketing Environment
2. Ability to understand the Segmenting, Targeting and Positioning Strategies
3. Familiar the process of finalization of the prices of the production and know the various pricing strategies
4. Understand the concept of Marketing Communication and communication mix
5. Adhere the concept of Marketing organisation and ability to understand the various marketing controls.

HUMAN RESOURCE MANAGEMENT

Subject Code: **18MS02T3**

COURSE OUTCOMES:

1. Able to understand the concept of Human Resource Management.
2. Students able to understand the concept of Manpower Planning, Recruitment and Training development
3. Ability to understand the various methods and techniques of Performance Evaluation.
4. Students are able to understand the wage concepts
5. Ability to understand the important actors in Industrial Relations.

PRODUCTION & OPERATIONS MANAGEMENT

Subject Code: **18MS02T4**

COURSE OUTCOMES:

1. Understand the role of operations management in the overall business strategy of the firm.
2. Know the basic concepts & techniques of Production Planning and Control
3. Understand the various control charts for measuring the quality of the product.
4. Familiar with the basic concept of Total Quality Management
5. Know the overview of Stores Management

RESEARCH METHODOLOGY

Subject Code: **18MS02T5**

COURSE OUTCOMES:

1. Understand the basic framework of research process.
2. Familiar with the various sources of data, sampling techniques and various kinds of scales.
3. Understand the various data analysis techniques.
4. Know the various statistical techniques used in data analysis
5. Understand the significance of Multivariate Analysis, T-test and Z test

ORGANISATIONAL BEHAVIOUR

Subject Code: **18MS02T6**

COURSE OUTCOMES:

1. Understand the principles and concept of organisational behaviour
2. Understand the concepts of Perception, Leadership and Motivation
3. Familiar with the various Leadership skills and know the importance of Groups
4. Understand the various team building techniques and also familiar with conflict resolution concept.
5. Familiar the concepts of Organizational Culture, Design and Development

STRATEGIC MANAGEMENT

Subject Code: **18MS03T1**

COURSE OUTCOMES:

1. Ability to understand the basic concept of Strategic Management and its significance
2. Know the importance of Environmental Scanning in Strategic formulation
3. Understand the important considerations in strategy formulation
4. Familiar with the various strategy implementation process
5. Understand the key considerations in Strategy Evaluation and Control

LEGAL ASPECTS OF BUSINESS

Subject Code: **18MS03T2**

COURSE OUTCOMES:

1. Familiar the important provisions of Indian Contract Act, 1872
2. Able to know the overview of Indian Sale of Goods Act, 1930
3. Ability to understand the three tier consumer grievance redressal agencies
4. Know the various kinds partners and features of Indian Partnership Act, 1932
5. Ability to understand the various provisions of Companies Act, 1956

BUSINESS ETHICS & CORPORATE GOVERNANCE

Subject Code: **18MS03T3**

COURSE OUTCOMES:

1. Ability to understand the importance of Ethics
2. Understand the impact of Globalization on Indian Business ethics
3. Familiar with the Ethical aspects in Marketing, Finance and HR
4. Ability to understand the significance on Corporate Governance in Business
5. Students aware about the Indian model of Corporate Governance

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SECURITY ANALYSIS & PORTFOLIO MANAGEMENT

Subject Code: **18MS03F4**

COURSE OUTCOMES:

1. Familiar with the fundamentals of Investments and its avenues.
2. Understand the relationship of the risk and return
3. Familiar the students with the fundamental and technical analysis of the diverse investment avenues
4. Know the various models of Portfolio analysis and selection
5. Understand the significance of Portfolio Evaluation and Revision.

BANKING AND INSURANCE MANAGEMENT

Subject Code: **18MS03F5**

COURSE OUTCOMES:

1. Ability to understand the Indian Banking system and know the CAMEL Approach
2. Adhere the how the banks used their funds and understand the various loan products
3. Adhere the recent innovations in Indian banking system
4. Familiar the Indian Insurance sector and adhere the role of IRDA
5. Ability to understand the various concepts in Life Insurance and General Insurance

ADVANCED COST AND MANAGEMENT ACCOUNTING

Subject Code: **18MS03F6**

COURSE OUTCOMES:

1. Know the importance of Management Accounting in business decision making
2. Able to know the comparative analysis and common size analysis in detail
3. Able To know about the concept of budgetary control
4. Able To know the estimation of costing and decision making
5. Able To know the concepts of standard costing

STRATEGIC FINANCIAL MANAGEMENT

Subject Code: **18MS03F7**

COURSE OUTCOMES:

1. Students are able to understand the concepts of corporate strategic Financial Planning.
2. Familiar with the various corporate financial strategies
3. Know the various techniques of Corporate Investment strategy
4. Familiar with the various types of Mergers and its procedures in corporate world
5. Understand the various Corporate Restructuring strategies.

CONSUMER BEHAVIOUR

Subject Code: **18MS03M4**

COURSE OUTCOMES:

1. Ability to Understand the concept of Consumer Behaviour with the assumptions
2. Clearly know the psychological foundation of Consumer behaviour
3. Familiarize the steps in Consumer Communication process.
4. Understand the Consumerism and related concepts
5. Familiar with the legal framework of Consumer protection

RETAIL MARKETING

Subject Code: **18MS03M5**

COURSE OUTCOMES:

1. Able to understand the basic concept of retailing in India.
2. Familiar the various retail strategies of retail firms.
3. Know the various considerations in selection retail location.
4. Know the concept of Store Layout and Design to attract the customers
5. Understand various Retail pricing strategies at retail stores in India

CUSTOMER RELATIONSHIP MANAGEMENT

Subject Code: **18MS03M6**

COURSE OUTCOMES:

1. Ability to understand the importance of Customer Relationship Management in Marketing Decision Making
2. Familiar with the various CRM strategies adopted by companies.
3. Adhere the various marketing aspects in CRM
4. Understand the various customer retention strategies
5. Familiar with the operational and implementation aspects of CRM.

STRATEGIC MARKETING MANAGEMENT

Subject Code: **18MS03M7**

COURSE OUTCOMES:

1. Able To describe the various Strategic Marketing strategies in detail
2. Able To know the various marketing strategies and models used in the organization
3. Able To know the various techniques of strategic marketing
4. Able To know the environmental factors affecting strategic marketing
5. Able To know about new product development

LEADERSHIP MANAGEMENT

Subject Code: **18MS03H4**

COURSE OUTCOMES:

1. Familiar the various Leadership Models
2. Understand the various theories of Motivation

3. Understand the Leadership Development in organisations
4. Ability to know the importance of Strategic Leadership
5. Ability to understand the various cross cultural Leadership across the globe

COMPENSATION & REWARD MANAGEMENT

Subject Code: **18MS03H5**

COURSE OUTCOMES:

1. Understand the various wage concepts
2. Familiar with the various methods of Job Evaluations
3. Understand the functions of Payroll Department.
4. Ability to understand the Wage and Salary Administration in India
5. Familiar the Pay structure and its various components

PERFORMANCE MANAGEMENT

Subject Code: **18MS03H6**

COURSE OUTCOMES:

1. Familiar with the overview of Performance Management
2. Know the overview of Performance Management planning
3. Understand the performance management systems
4. Understand the significance of Performance Monitoring and counselling.
5. Ability to know the various performance management skills

STRATEGIC HUMAN RESOURCE MANAGEMENT

Subject Code: **18MS03H7**

COURSE OUTCOMES:

1. Know the distinction between the HRM and Strategic HRM.
2. Adhere the levels in Strategic Human Resource Planning
3. Familiar with various elements in Strategy Implementation
4. Understand the Strategic Human Resource Development
5. Adhere the various approaches in HR Evaluation

OGISTICS & SUPPLY CHAIN MANAGEMENT

Subject Code: **18MS04T1**

COURSE OUTCOMES:

1. Ability to understand the issues in Logistics Supply Chain Management
2. Understand the measures of Logistics cost and performance

3. Familiar with the logistics and supply chain relationship
4. Ability to know the sourcing, transportation and pricing in supply chain
5. Know the International Supply Chain Management

ENTREPRENEURSHIP DEVELOPMENT

Subject Code: **18MS04T2**

COURSE OUTCOMES:

1. Understand the concepts and fundamentals of Entrepreneurship
2. Familiar with the various Entrepreneurial Training Programmes
3. Ability to understand the various considerations in Project feasibility study
4. Know the various policy of MSME and familiar with the reasons for sickness
5. Understand the process of business idea generation and converting the idea into a business model

FINANCIAL MARKETS & SERVICES

Subject Code: **18MS04F3**

COURSE OUTCOMES:

1. Able to understand the structure of Indian Financial System & understand the role of SEBI
2. Ability to understand the legal framework of Financial Services in India
3. Adhere the legal guidelines for Venture Capital firms in India.
4. Understand the various credit rating agencies (CRISIL, CARE, ICAR) rating methodologies
5. Familiar with the various types of Mutual Funds in India

GLOBAL FINANCIAL MANAGEMENT

Subject Code: **18MS04F4**

COURSE OUTCOMES:

1. A broad view of International Monetary Systems and its understanding to enable a global manager to do business in a global setting.
2. Able to know an overview of Foreign Exchange Markets.
3. Familiar with the various operational strategies of Multinational Corporations
4. Ability to understand the various International Investment Decisions.
5. Familiarize the International Tax Environment and International Capital Budgeting

FINANCIAL RISK MANAGEMENT

Subject Code: **18MS04F5**

COURSE OUTCOMES:

1. Able to know the Risk management concept and their classification
2. Familiar with various risk management and measurement concepts.

3. Familiar the various techniques and tools of Risk Management
4. Understand the various risk measurement techniques.
5. Understand the various Options and Futures strategies.

TAX MANAGEMENT

Subject Code: **18MS04F6**

COURSE OUTCOMES:

1. Able to understand the Legal Principles of Taxation Laws in India.
2. Understand the concepts of CENVAT, Customs Duty and Excise Duty.
3. Ability to understand tax planning and its components
4. Familiar the various tax incentives and schemes
5. Know the important considerations in Multinational Taxation

SERVICES MARKETING

Subject Code: **18MS04M3**

COURSE OUTCOMES:

1. Develop familiarity with the concepts of Services Marketing
2. Ability to know the key dimensions in Service Marketing
3. Adhere the Services Marketing Mix elements
4. Familiar with the various Services marketing strategies in various sectors
5. Understand the Marketing practices in various service industries

PROMOTION & DISTRIBUTION MANAGEMENT

Subject Code: **18MS04M4**

COURSE OUTCOMES:

1. Understand the various Promotional tools and its objectives.
2. Familiar with the overview of Distribution management
3. Understand the Designing Channel System.
4. Ability to understand the various types of channels and channel designs.
5. Familiar with the various ethical and social issues in distribution management

GLOBAL MARKETING MANAGEMENT

Subject Code: **18MS04M5**

COURSE OUTCOMES:

1. Ability to understand conceptual framework of global marketing
2. Familiar with the international marketing strategy
3. Understand the International product strategies
4. Understand the Global Marketing Channels and Promotion
5. Know the export and import procedures

PRODUCT & BRAND MANAGEMENT

Subject Code: **18MS04M6**

COURSE OUTCOMES:

1. Able to describe the basic concepts of Product
2. Able to know the process of new product planning
3. Able to demonstrate the various Branding Strategies adopted by the companies
4. Able to know about market testing and launching
5. Able to discuss about the Packaging decisions

GLOBAL HRM

Subject Code: **18MS04H3**

COURSE OUTCOMES:

1. Ability to know the overview of Rural Economy and Policy interventions
2. Familiar with the overview of Rural Marketing in India and its potentialities
3. Understand the various rural marketing decisions
4. Familiar with the pricing strategies and policies formulated by rural marketers
5. Adhere the overview of Distribution and Logistical Management issues in rural markers.

ORGANISATIONAL DEVELOPMENT & CHANGE MANAGEMENT

Subject Code: **18MS04H4**

COURSE OUTCOMES:

1. Familiar with the Global perspective HRM
2. Understand the various International Assignments and selection procedures
3. Know the importance and significance of Cross Cultural Management
4. Familiar with the Global Compensation Strategies
5. Understand the Global Strategic Advantage through the HRD.

LABOUR WELFARE & LEGISLATION

Subject Code: **18MS04H5**

COURSE OUTCOMES:

1. Understand the nature of change management in organisation.
2. Adhere the important diagrams used in Change process
3. Familiar the various Organisational Development interventions
4. Familiar with the contemporary issues in Labour Management.
5. Understand the various team building concepts

MANAGEMENT OF INDUSTRIAL RELATIONS

Subject Code: **18MS04H6**

COURSE OUTCOMES:

1. Able to understand the Historical Perspective of Industrial relations in India
2. Familiar with the legal framework of Trade Unions in India.
3. Adhere the importance of Workers Participation in management
4. Understand the various Social Security measures in India
5. Know the employee grievance mechanism in India.

SITE 21 Regulation

Masters in Business Administration

PRINCIPLES OF MANAGEMENT
Subject Code**: 21MS11T1**
COURSE OUTCOMES: 1. Students are able to understand the development of management thought.s 2. Clearly know the concepts of Planning, Organizing and their components. 3. Understand the methods and techniques of Directing and Controlling 4. Familiar with the various Decision Making tools. 5. Know the various contemporary issues.
MANAGERIAL ECONOMICS
Subject Code**: 21MS11T2**
COURSE OUTCOMES: 1. Students are experienced with various economic concepts with reference tobusiness 2. Ability to understand the Demand and Supply concepts 3. Familiar with the production function with one variable and two variable inputs 4. Ability to understand the various types of costs **5.** Students are aware the various market structures and know the various price determination in each market structure
ACCOUNTING FOR MANAGERS
Subject Code**: 21MS11T3**
COURSE OUTCOMES: 1. Know the various concepts of Accounting 2. Students are ability to understand the procedure for preparation of final accounts 3. Students are understand the various tools for analysing financial statements 4. Students are proficient with various cost concepts and cost estimation tools **5.** Ability to understand the various Cost Accounting techniques and methods
MANAGERIAL COMMUNICATION & SOFT SKILLS
Subject Code: 21MS11T4
COURSE OUTCOMES: 1. Ability to understand the importance of Business Communication 2. Understand the formal and informal communication 3. Ability to understand the various communication styles 4. Familiar with the various business writing skills **5.** Familiar with the various presentation techniques and types

QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS

Subject Code: 21MS11T5

COURSE OUTCOMES:

1. Able to understand the importance of Mathematics and Statistical Techniques in Decisions Making
2. Ability to understand the steps involved in decision making
3. Understand the steps involved in constructing Linear Programming Model
4. Familiar with the transportation and assignment models and Game Theory
5. Understand the Project Management techniques.

BUSINESS ENVIRONMENT

Subject Code: 21MS11T6

COURSE OUTCOMES:

1. Students are learned with the knowledge of business environment.
2. Students are able to gain knowledge regarding fiscal policy, balance of payment, trade
3. policies and consumer protection act-1986
4. Ability to know the various components of Indian Economy
5. Know the overview of Indian Foreign Trade Policy with global perspective.

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INFORMATION TECHNOLOGY LAB

Subject Code: 21MS11T7

COURSE OUTCOMES:

1. Familiar with the various softwares used by the business world.
2. Know the various Financial Modelling techniques.
3. Understand the importance of various statistical models applied in managerial decision making
4. Familiar with the various data collection and data presentation methods.
5. Understand the various procedures for designing of Mini Projects and other course works.

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FINANCIAL MANAGEMENT

Subject Code: 21MS12T1

COURSE OUTCOMES:

1. Ability to understand the basic concepts of Financial Management
2. Familiar with the various methods to estimate the required rate of return
3. Understand the various phases of Capital Budgeting & familiar with the various project review techniques.

4. Ability to understand the various dividend theories along with their assumptions
5. Know the various factors affecting the Working Capital requirements of business

MARKETING MANAGEMENT

Subject Code: 21MS12T2

COURSE OUTCOMES:

1. Ability to understand the basic concepts of Marketing & adhere the Indian Marketing Environment
2. Ability to understand the Segmenting, Targeting and Positioning Strategies
3. Familiar the process of finalization of the prices of the production and know the various pricing strategies
4. Understand the concept of Marketing Communication and communication mix
5. Adhere the concept of Marketing organisation and ability to understand the various marketing controls**.**

HUMAN RESOURCE MANAGEMENT

Subject Code: 21MS12T3

COURSE OUTCOMES:

1. Able to understand the concept of Human Resource Management.
2. Students able to understand the concept of Manpower Planning, Recruitment and Training development
3. Ability to understand the various methods and techniques of Performance Evaluation.
4. Students are able to understand the wage concepts
5. Ability to understand the important actors in Industrial Relations.

PRODUCTION & OPERATIONS MANAGEMENT

Subject Code: 21MS12T4

COURSE OUTCOMES:

1. Understand the role of operations management in the overall business strategy of the firm.
2. Know the basic concepts & techniques of Production Planning and Control
3. Understand the various control charts for measuring the quality of the product.
4. Familiar with the basic concept of Total Quality Management
5. Know the overview of Stores Management

RESEARCH METHODOLOGY

Subject Code: 21MS12T5

COURSE OUTCOMES:

1. Understand the basic framework of research process.
2. Familiar with the various sources of data, sampling techniques and various kinds of scales.

3. Understand the various data analysis techniques.
4. Know the various statistical techniques used in data analysis
5. Understand the significance of Multivariate Analysis, T-test and Z test.

ORGANISATIONAL BEHAVIOUR

Subject Code: 21MS12T6

COURSE OUTCOMES:

1. Understand the principles and concept of organisational behaviour
2. Understand the concepts of Perception, Leadership and Motivation
3. Familiar with the various Leadership skills and know the importance of Groups
4. Understand the various team building techniques and also familiar with conflict resolution concept.
5. Familiar the concepts of Organizational Culture, Design and Development

Strategic Management

Subject Code: 21MS03T1

COURSE OUTCOMES:

1. Ability to understand the basic concept of Strategic Management and its significance
2. Know the importance of Environmental Scanning in Strategic formulation
3. Understand the important considerations in strategy formulation
4. Familiar with the various strategy implementation process
5. Understand the key considerations in Strategy Evaluation and Control.

LEGAL ASPECTS OF BUSINESS

Subject Code: 21MS03T2

COURSE OUTCOMES:

1. Familiar the important provisions of Indian Contract Act, 1872
2. Able to know the overview of Indian Sale of Goods Act, 1930
3. Ability to understand the three tier consumer grievance redressal agencies
4. Know the various kinds partners and features of Indian Partnership Act, 1932
5. Ability to understand the various provisions of Companies Act, 1956

BUSINESS ETHICS & CORPORATE GOVERNANCE

Subject Code: 21MS03T3

COURSE OUTCOMES:

1. Ability to understand the importance of Ethics
2. Understand the impact of Globalization on Indian Business ethics
3. Familiar with the Ethical aspects in Marketing, Finance and HR
4. Ability to understand the significance on Corporate Governance in Business
5. Students aware about the Indian model of Corporate Governance

SECURITY ANALYSIS & PORTFOLIO MANAGEMENT

Subject Code: 21MS03T4

COURSE OUTCOMES:

1. Familiar with the fundamentals of Investments and its avenues.
2. Understand the relationship of the risk and return
3. Familiar the students with the fundamental and technical analysis of the diverse
4. investment avenues
5. Know the various models of Portfolio analysis and selection
6. Understand the significance of Portfolio Evaluation and Revision

BANKING AND INSURANCE MANAGEMENT

Subject Code: 21MS03T5

COURSE OUTCOMES:

1. Ability to understand the Indian Banking system and know the CAMEL Approach
2. Adhere the how the banks used their funds and understand the various loan products
3. Adhere the recent innovations in Indian banking system
4. Familiar the Indian Insurance sector and adhere the role of IRDA
5. Ability to understand the various concepts in Life Insurance and General Insurance

PROJECT MANAGEMENT

Subject Code: 21MS03T6

COURSE OUTCOMES:

1. Understand the overview of fundamentals of Project Management .
2. Familiar with the various Project Feasibility Studies
3. Know the various methodologies and technique of Project Evaluation
4. Understand the overview of PERT and CPM methods and Project Crashing techqniues
5. Ability to understand the roles and responsibilities of project manager and also know the role of various stakeholders of project

STRATEGIC FINANCIAL MANAGEMENT

Subject Code: 21MS03T7

COURSE OUTCOMES:

1. Students areable to understand the concepts of corporate strategic Financial Planning.
2. Familiar with the various corporate financial strategies
3. Know the various techqniues of Corporate Investment strategy
4. Familiar with the various types of Mergers and its procedures in corporate world
5. Understand the various Corporate Restructuring strategies.

CONSUMER BEHAVIOUR

Subject Code: 21MS13M4

COURSE OUTCOMES:

1. Ability to Understand the concept of Consumer Behaviour with the assumptions
2. Clearly know the psychological foundation of Consumer behaviour
3. Familiarize the steps in Consumer Communication process.
4. Understand the Consumerism and related concepts
5. Familiar with the legal framework of Consumer protection

RETAIL MANAGEMENT

Subject Code: 21MS13M5

COURSE OUTCOMES:

1. Able to understand the basic concept of retailing in India.
2. Familiar the various retail strategies of retail firms.
3. Know the various considerations in selection retail location.
4. Know the concept of Store Layout and Design to attract the customers
5. Understand various Retail pricing strategies at retail stores in India.

CUSTOMER RELATIONSHIP MANAGEMENT

Subject Code: 21MS13M6

COURSE OUTCOMES:

1. Ability to understand the importance of Customer Relationship Management in Marketing Decision Making
2. Familiar with the various CRM strategies adopted by companies.
3. Adhere the various marketing aspects in CRM
4. Understand the various customer retention strategies
5. Familiar with the operational and implementation aspects of CRM.

DIGITAL & SOCIAL MEDIA MARKETING

Subject Code: 21MS13M7

COURSE OUTCOMES:

1. Ability to understand the various concepts in Digital Marketing
2. Know the various channels of Digital Marketing
3. Understand the overview of Digital Market Plan
4. Familiar with the various Online Advertising related tools
5. Understand the various Social Media Marketing concepts.

LEADERSHIP MANAGEMENT

Subject Code: 21MS13H4

COURSE OUTCOMES:

1. Familiar the various Leadership Models
2. Understand the various theories of Motivation
3. Understand the Leadership Development in organisations
4. Ability to know the importance of Strategic Leadership
5. Ability to understand the various cross cultural Leadership across the globe

COMPENSATION & REWARD MANAGEMENT

Subject Code: 21MS13H5

COURSE OUTCOMES:

1. Understand the various wage concepts
2. Familiar with the various methods of Job Evaluations
3. Understand the functions of Payroll Department.
4. Ability to understand the Wage and Salary Administration in India
5. Familiar the Pay structure and its various components

PERFORMANCE MANAGEMENT

Subject Code: 21MS13H6

COURSE OUTCOMES:

1. Familiar with the overview of Performance Management
2. Know the overview of Performance Management planning
3. Understand the performance management systems
4. Understand the significance of Performance Monitoring and counselling.

5. Ability to know the various performance management skills

STRATEGIC HUMAN RESOURCE MANAGEMENT

Subject Code: 21MS13H7

COURSE OUTCOMES:

1. Know the distinction between the HRM and Strategic HRM.
2. Adhere the levels in Strategic Human Resource Planning
3. Familiar with various elements in Strategy Implementation
4. Understand the Strategic Human Resource Development
5. Adhere the various approaches in HR Evaluation.

Logistics & Supply Chain Management

Subject Code: 21MS04T1

COURSE OUTCOMES:

1. Ability to understand the issues in Logistics Supply Chain Management
2. Understand the measures of Logistics cost and performance
3. Familiar with the logitistics and supply chain relationship
4. Ability to know the sourcing, transportation and princing in supply chain
5. Know the t International Supply Chain Management

ENTREPRENEURSHIP DEVELOPMENT

Subject Code: 21MS04T2

COURSE OUTCOMES:

1. Understand the concepts and fundamentals of Entrepreneurship
2. Familiar with the various Entrepreneurial Training Programmes
3. Ability to understand the various considerations in Project feasibility study
4. Know the various policies of MSME and familiar with the reasons for sickness
5. Understand the process of business idea generation and converting the idea into a Business model.

FINANCIAL MARKETS & SERVICES

Subject Code: 21MS04T3

COURSE OUTCOMES:

1. Able to understand the structure of Indian Financial System & understand the role of SEBI
2. Ability to understand the legal framework of Financial Services in India
3. Adhere the legal guidelines for Venture Capital firms in India.

4. Understand the various credit rating agencies (CRISIL, CARE, ICAR) rating methodologies
5. Familiar with the various types of Mutual Funds in India.

GLOBAL FINANCIAL MANAGEMENT

Subject Code: 21MS04T4

COURSE OUTCOMES:

1. A broad view of International Monetary Systems and its understanding to enable a global manager to do business in a global setting.
2. Able to know an overview of Foreign Exchange Markets.
3. Familiar with the various operational strategies of Multinational Corporations
4. Ability to understand the various International Investment Decisions.
5. Familiarize the International Tax Environment and International Capital Budgeting

INANCIAL RISK MANAGEMENT

Subject Code: 21MS04T5

COURSE OUTCOMES:

1. Able to know the Risk management concept and their classification
2. Familiar with various risk management and measuresment cocnepts.
3. Familiar the various techniques and tools of Risk Management
4. Familiar with the various kinds of derivatives including forwards and future contacts.
5. Understand the various Options and Futures strategies.

TAX MANAGEMENT

Subject Code: 21MS04T6

COURSE OUTCOMES:

1. Able to understand the Legal Principles of Taxation Laws in India.
2. Understand the concepts of CENVAT, Customs Duty and Excise Duty.
3. Ability to understand tax planning and its components
4. Familiar the various tax incentives and schemes
5. Know the important considerations in Multinational Taxation

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SERVICES MARKETING

Subject Code: 21MS14M3

COURSE OUTCOMES:

1. Develop familiarity with the concepts of Services Marketing
2. Ability to know the key dimensions in Service Marketing
3. Adhere the Services Marketing Mix elements
4. Familiar with the various Services marketing strategies in various sectors
5. Understand the Marketing practices in various service industries

PROMOTION & DISTRIBUTION MANAGEMENT

Subject Code: 21MS14M4

COURSE OUTCOMES:

1. Understand the various Promotional tools and its objectives.
2. Familiar with the overview of Distribution management
3. Understand the Designing Channel System.
4. Ability to understand the various types of channels and channel designs.
5. Familiar with the various ethical and social issues in distribution management.

GLOBAL MARKETING MANAGEMENT

Subject Code: 21MS14M5

COURSE OUTCOMES:

1. Ability to understand conceptual framework of global marketing
2. Familiar with the international marketing strategy
3. Understand the International product strategies
4. Understand the Global Marketing Channels and Promotion
5. Know the export and import procedures

RURAL MARKETING

Subject Code: 21MS14M6

COURSE OUTCOMES:

1. Ability to know the overview of Rural Economy and Policy interventions
2. Familiar with the overview of Rural Marketing in India and its potentialities
3. Understand the various rural marketing decisions
4. Familiar with the pricing strategies and policies formulated by rural marketers
5. Adhere the overview of Distribution and Logistical Management issues in rural markets**.**

GLOBAL HRM

Subject Code: 21MS14H3

COURSE OUTCOMES:

1. Familiar with the Global perspective HRM
2. Understand the various International Assignments and selection procedures
3. Know the importance and significance of Cross Cultural Management
4. Familiar with the Global Compensation Strategies
5. Understand the Global Strategic Advantage through the HRD.

ORGANISATIONAL DEVELOPMENT & CHANGE MANAGEMENT

Subject Code: 21MS14H4

COURSE OUTCOMES:

1. Understand the nature of change management in organisation.
2. Adhere the important diagrams used in Change process
3. Familiar the various Organisational Development interventions
4. Familiar with the contemporary issues in Labour Management.
5. Understand the various team building concepts.

LABOUR WELFARE & LEGISLATION

Subject Code: 21MS14H5

COURSE OUTCOMES:

1. Ability to understand the importance of various welfare legislations
2. Familiar with the industrial relation legislations with reference to the industrial undertakings
3. Understand the various wage legislations
4. Understand the importance concept of labour welfare
5. Know the various statutory and non-statutory labour welfare programmes.

MANAGEMENT OF INDUSTRIAL RELATIONS

Subject Code: 21MS14H6

COURSE OUTCOMES:

1. Able to understand the Historical Perspective of Industrial relations in India
2. Familiar with the legal framework of Trade Unions in India.
3. Adhere the importance of Workers Participation in management
4. Understand the various Social Security measures in India
5. Know the employee grievance mechanism in India.