Academic Year-2019-20

Department of Automobile Engineering

Vision of the Institute

To be a respected and most sought after engineering educational institutions engaged in equipping individuals capable of building learning organizations in the new millennium.

Mission of the Institute

To develop competent students with good value systems and face challenges of the continuously changing world.

Vision of the Department

To establish the department as a renowned center of excellence in the area of scientific education, research with industrial guidance and exploration of the latest advances in the rapidly changing field of Automobile Engineering.

Mission of the Department

Mission 1. The Department will serve its students, industry and society by fulfilling the mission of learning, and engagement through the creation, dissemination and application of engineering methods.

Mission 2. Encourage students to continuously challenge the existing methods in Automobile Engineering with an intention to align the students towards research.

Mission 3. Impart knowledge on practical aspects and professional standards relevant to the practice of Automobile Engineering in the many aspects of modern life where it plays a vital role.

Program Educational Objectives

PEO 1. Graduates shall display technical knowledge in basic Mechanical and Automobile Engineering subject areas enabling them to find career opportunities in relevant government agencies, reputed private firms.

PEO 2. Graduates shall gain practical knowledge in the working of Automobile Systems, capable of working on indigenous projects, ventures related to automotive discipline.

PEO 3. Graduates shall be well versed with the academic learning material of the course syllabus and ready to take up further learning through higher education and scientific research.

PEO 4. Graduates shall be well equipped with the requirements of the current industries to obtain job opportunities in Mechanical and Automotive sectors in the design, Manufacturing, Analysis domains.

Program Specific Objectives

PSO1. Graduate will demonstrate the knowledge to design, develop, implement, and use same into various domains to identify cause and hence provide solutions in the automotive field.

PSO2. Graduate to work in interdisciplinary environment to design systems with the future emission norms and safety standards in automobile sector.

PSO3. Graduate will be able to pursue of lifelong learning and professional development to face the challenging and emerging needs of our society.

Course Name: (Engineering Mathematics III-8MAT31)

CO-1	Know the use of periodic signals and Fourier series to analyze circuits and system communications.
CO-2	Explain the general linear system theory for continuous-time signals and digital signal processing using the Fourier Transform and z-transform.
CO-3	Employ appropriate numerical methods to solve algebraic and transcendental equations
CO-4	Apply Green's Theorem, Divergence Theorem and Stokes' theorem in various applications in the field of electro-magnetic and gravitational fields and fluid flow problems.
CO-5	Determine the extremals of functionals and solve the simple problems of the calculus of variations.

Course Name: (Engineering Thermodynamics-18AU32)

CO-1	Explain different types of material crystal structures and arrangement of atoms.
CO-2	Describe various mechanical properties of materials.
CO-3	Describe about different types of fractures and their importance in engineering. applications.
CO-4	Draw and Interpret TTT curves and Iron carbon diagram
CO-5	Identify various ferrous metals and nonferrous metals and alloys based on composition and properties
CO-6	Describe about different types of composite materials and their production and application in engineering field

Course Name: (Material Science And Metrology-18AU33)

CO-1	Define and explain fundamental thermodynamic laws and concepts, work, various types of works and heat and its applications, entropy and its relations, Zeroth, First & Second law of thermodynamics and its applications.
CO-2	Explain various thermodynamic relations, constants of gas and basics of ideal gas & its mixtures.
CO-3	Calculate load and IP, BP and other performance characteristics of I.C. engines.
CO-4	Explain the selection of air conditioning system; evaluate thermal performance of refrigeration cycles.
CO-5	Calculate efficiency and MEP of various gas power & vapor power cycles.
CO-6	Explain the principles of gas turbine & jet propulsion system and their fuels

Course Name: (Mechanics Of Materials-18AU34)

CO-1	Explain the concepts of stress, strain; material properties.
CO-2	Explain the behavior of materials under different loading conditions
CO-3	Calculate SF and BM and draw the SF and BM diagrams types of beams carrying different types of loads.
CO-4	Explain the concepts of torque and calculate the diameter of hollow and solid shafts subjected to twisting moment.
CO-5	Stresses & angle of twist induced into the shaft due to twisting.
CO-6	Calculate Critical load for different types of columns using Euler's, Rankine's equations & limitations of these equations and explain the applications.

Course Name: (MMM-18AU35)

CO-1	Explain the significance of mechanical measurements and components of a generalized measurement system.
CO-2	Classify and explain principles of various types of transducers, modifying devices and terminating devices.
CO-3	Explain the working principle of instruments used for measurement of Force, Torque, Pressure, Temperature, Strain and Vibration
CO-4	Classify the comparators and explain their working principles.
CO-5	Explain the objectives of metrology and explain various standards of length such as line and end standards
CO-6	Explain the usage of instruments used for the measurement of screw thread and gear parameters.

Course Name: (Manufacturing Process-I-18AU36)

CO-1	Define various terminologies used in casting process.
CO-2	Explain basic concepts used in construction of various moulds.
CO-3	Analyze the working of various moldings machines.
CO-4	Select the appropriate moulding machine and moulding process depending on the type of raw material required to produce the desired product
CO-5	Select the appropriate joining process depending on the type of joint required to produce the desired product.
CO-6	Select the Non-Destructive Testing method for application

Course: Dynamics of Machines-17AU52

CO-1	Calculate static forces at various points in different types of mechanism
CO-2	Calculate fluctuation of energy in flywheel and dimensions of flywheel
CO-3	Balance rotating masses and of reciprocating masses in internal combustion engine, V engine, radial engine and to solve analytically and graphically to balance the systems
CO-4	Describe gyroscopic couple and to understand effect of gyroscopic couple
CO-5	Calculate gyroscopic effect on stability of vehicles, ship, aircraft etc.

CO-6	Analyze effect of profile of cam on motion of followers

Course Name: Design of Machine Elements 1-17AU53

CO-1	To know the Standards in Design, Selection of materials as per CODES &STANDARDS
CO-2	Analyze the various modes of failure of machine components under different static load conditions and use appropriate theories of failures
CO-3	To understand the Impact stresses for machine components, Fatigue stress analysis stress concentration
CO-4	To evaluate dimensions of shafts and other simple machine components
CO-5	Able to understand design of joints like welded and riveted joints
CO-6	Terminologies and Design of threaded joints and power screws

Course Name: Automotive Fuels & Combustion-17AU54

CO-1	Introduce understanding about available energy sources for ICE
CO-2	Distinguish between properties of difference fuels
CO-3	Determine the A/F ratio for complete combustion
CO-4	Explain and differentiate between multi fuel and dual fuel engines
CO-5	Design SI& CI engine combustion chambers
CO-6	Explain stages of combustion in S.I. & C.I. engines

Course Name: (CAD/CAM)17AU551

CO-1	Use the Solid Edge software for drawing and solid modeling.
CO-2	Sketch the solutions of the sections of solids, determine the inclination of the cutting plane when true shape of section of an object is given.
CO-3	Sketch and draw the orthographic views of simple machine parts (top view, front view, side view) using first angle projection. • Sketch and draw the sectional views of simple machine parts.
CO-4	Sketch and draw ISO metric threads, Square, ACME & BSW forms of threads using conventional representation.
CO-5	Distinguish between temporary and permanent joints and sketch and draw the different types of keys. • Sketch and draw two views of different types of riveted joints
C0-6	Create solid models of different parts and assemble them and draw their sectional views using Solid Edge software. • Prepare assembly drawings along with their bill of material.

Course Name: (AE & ES)-15AU71

CO-1	Explain the construction of battery used in automotive vehicles.
CO-2	Describe the construction and working of cranking motor, D. C. generator, alternator, ignition systems along with trouble shooting.
CO-3	Discuss the faults arising in automotive wiring and lighting system.

CO-4	Explain various chassis electrical systems.
CO-5	Describe transducers and sensors.
CO-6	Explain various aspects of electrical and Hybrid vehicles.

Course Name: (Automotive Engine Component Design & AS-15AU72

CO-1	Calculate major dimensions of engine components like cylinder, piston, connecting rod, crankshaft, valve and valve operating mechanisms.
CO-2	Analyze working of two stroke engines.
CO-3	Select suitable scavenging process for two stroke engines.
CO-4	Select suitable lubricant and lubrication system for given engine
CO-5	Calculate amount coolant required and select suitable cooling system for given engine.
CO-6	Explain need for supercharger and modifications required in engine for supercharging.

Course Name: (Finite Element Modelling & Analysis)   -15AU73

CO-1	The question paper will have ten questions
CO-2	Each full question consists of 16 marks
CO-3	There will be 2full questions (with a maximum of four sub questions) from each module.
CO-4	Each full question will have sub questions covering all the topics under a module.
CO-5	The students will have to answer 5 full questions, selecting one full question from each module.

Course Name: (Earth Moving Equipment& Tractors) -15AU741

CO-1	Gain the knowledge about various basic operations and applications of earth moving equipment.
CO-2	Acquire the knowledge of under carriage, hydraulics, steering of tractors.
CO-3	Get the complete information about the earth moving equipment
CO-4	Select suitable machine depending on type of land, haul distance, climate, etc.

Course Name: (Two & Three Wheeled Vehicle)-15AU754

CO-1	Describe construction and working of different type of internal combustion engines for two and three wheeled vehicles.
CO-2	Laydown wiring diagram for two-wheeler and three wheeled vehicles.
CO-3	Explain types of clutches, transmission and final drives used for two and three wheeled vehicles.
CO-4	Describe types of frames, brakes and tires used for two and three wheeled vehicles.
CO-5	Laydown maintenance schedule for two and three wheeled vehicles.

Course Name: (CP & SM)-18MAT41

CO-1	Solve first and second order ordinary differential equation arising in flow problems using single step and multistep numerical methods.

CO-2	Illustrate problems of potential theory, quantum mechanics and heat conduction by employing notions and properties of Bessel's functions and Legendre's polynomials.
CO-3	Explain the concepts of analytic functions, residues, poles of complex potentials and describe conformal and Bilinear transformation arising in field theory and signal processing.
CO-4	Develop probability distribution of discrete, continuous random variables and joint probability distribution occurring in digital signal processing, information theory and design engineering.
CO-5	. Demonstrate testing of hypothesis of sampling distributions and illustrate examples of Markov chains related to discrete parameter stochastic process.

Course Name: (Fluid Mechanics) 18AU42

CO-1	Define fluid properties and distinguish between types of fluids. • Describe Pascal's law, Hydrostatic law & their application to solve engineering static fluid problems.
CO-2	Explain the concepts of Buoyancy and stability of floating objects. • Explain the types of flows, application of continuity equations.
CO-3	Explain the forces acting when fluid is under motion & application of Bernoulli's equation for solving flow problems
CO-4	Estimate the various types of losses in pipes.
CO-5	Analyze various forces acting on submerged bodies in engineering flow problems.

Course Name: (Kinematics of Machine) 18AU43

CO-1	Define and explain the terms such as Link, Kinematic chain, Kinematic pair, types of pairs, degree freedom, Mechanism, Machine Mobility.
CO-2	Sketch and explain various types of mechanisms, and their inversions.
CO-3	Draw Velocity and Acceleration of simple mechanisms using Instantaneous center method, Analytical and Graphical methods.
CO-4	Explain the Gear terminology, Law of gearing, gear tooth systems
CO-5	Determine the velocity ratio of different types of gear trains using tabular and algebraic methods
CO-6	To draw cam profile and calculate the velocity and acceleration of cams at any given instant.

Course Name: (Automotive Engines)   :18AU44

CO-1	Explain the constructional details of SI and CI engines and classify engines.
CO-2	Explain the construction and working of carburetors and fuel injection pumps.
CO-3	Explain the combustion process in SI and CI engines.
CO-4	Suggest an efficient cooling system for IC engines.
CO-5	Select a proper lubricant to be used in an automobile used in various environmental conditions.

Course Name: (Computer Aided Machine Drawing) 18AU46

CO-1	Use the Solid Edge software for drawing and solid modeling.
CO-2	Sketch the solutions of the sections of solids, determine the inclination of the cutting plane when true shape of section of an object is given.
CO-3	Sketch and draw the orthographic views of simple machine parts (top view, front view, side view) using first angle projection. • Sketch and draw the sectional views of simple machine parts.
CO-4	Sketch and draw ISO metric threads, Square, ACME & BSW forms of threads using conventional representation.
CO-5	Distinguish between temporary and permanent joints and sketch and draw the different types of keys. • Sketch and draw two views of different types of riveted joints
C0-6	Create solid models of different parts and assemble them and draw their sectional views using Solid Edge software. • Prepare assembly drawings along with their bill of material.

Course Name: (Manufacturing Process-II)   18AU45

CO-1	Define various terminologies used in production technology.
CO-2	Explain basic concepts used in construction of various machine tools.
CO-3	Analyze the various mechanisms underlying the working of various machine tools.
CO-4	Select the appropriate machining process depending on the properties of the raw material required to produce the desired product.
CO-5	Select non-traditional machining process for given application.

Course Name: Automotive Chasis & Suspension)   :17AU61

CO-1	Explain different chassis layouts and frames and solve for stability and weight distribution and suitability cross sections for frames.
CO-2	Describe various Front Axles, factors of wheel alignment Steering Systems and Calculate dimensions of Front Axle.
CO-3	Describe various types of Propeller Shaft, Differential and Rear axles and can find dimensions of these components.
CO-4	Select type of brake required to given application and will be able to calculate basic dimension of brakes.
CO-5	Describe, About Various Types of Suspensions, Wheels, and Tires
Co-6	Calculate dimensions of different suspensions.

Course Name: (Heat and Mass Transfer)   17AU62

CO-1	Demonstrate fundamental principles and laws of conduction, convection, and radiation modes of heat transfer.

CO-2	Analyze one dimensional steady state heat transfer. Analyze one dimensional one-dimensional unsteady state heat transfer
CO-3	Analyze one dimensional forced convection heat transfer problems.
CO-4	Analyze one dimensional application like flow over flat plate etc.
CO-5	Introduce basic principle of heat exchanger analysis and thermal design.
Co-6	Apply laws of radiation heat transfer to solve engineering problems.

Course Name: (Design of Machine Elements-II)   17AU63

CO-1	Design the curved beams using the equations of stress.
CO-2	Design helical spring and leaf spring using the equations of stress and deflection.
CO-3	Design the spur gears and helical gears using different parameters and check the gears for dynamic and wear load.
CO-4	Design sliding contact and rolling contact bearings to find coefficient of friction, heat generated, heat dissipated and average life of bearings.
CO-5	Design the various types of bevel gears and worm gears for dynamic and wear load using various parameters.
Co-6	Analyze and design given machine components and present their designs in the form of a Report.

Course Name: (Automotive Transmission) :17AU64

CO-1	Explain the Constructional, design and working principles of different types of clutches.
CO-2	Explain the constructional and working principle of different types of fluid flywheel, torque converter and one-way clutches.
CO-3	Explain the constructional and working principle of different types of gear box.
CO-4	Determine the gear ratio, speed of vehicle and number of teeth on driving and driven gears.
CO-5	Explain the necessity and advantages of automatic transmission.
Co-6	Explain the constructional and principle of operation of different types of automatic transmissions and hydraulic control.

Course Name: (Composite Materials)   17AU653

CO-1	Describe basic concepts of composite materials and application of composite materials in various engineering fields.
CO-2	Describe various FRP processing.
CO-3	Describe selection, requirements for production and application of MMCs.
CO-4	Describe concepts of nano materials, nano technology and use of nano materials.
CO-5	Use various techniques used for MMCs production.
Co-6	Analyze micro mechanical properties of lamina using various approaches.

Course Name: (Vehicle Body Engineering & Safety15AU81

CO-1	Classify the vehicles and define basic terms.
CO-2	Select appropriate body material. 3. Calculate various aerodynamic forces and moments acting on vehicle.
CO-3	Calculate load distribution in vehicle body.
CO-4	Explain the ergonomics, stability the vehicle.
CO-5	Identify the various safety aspects in each vehicle.
Co-6	Identify various sources of noise and methods of noise separation

Course Name: (Mechanical Vibration:15AU82

CO-1	Classify different types of vibration / damping associated with systems and vibration measuring instruments.
CO-2	Calculate natural frequency, damping, logarithmic decrement, and other parameters of single degree of freedom un-damped / damped free vibrating systems
CO-3	Compute the response of single degree of freedom damped vibrating systems to different excitation forces.
CO-4	Determine the natural frequencies and the modes of two degree of freedom free vibrating systems
CO-5	Compare the natural frequencies / modes of multi-degree of freedom free vibrating systems using numerical methods

Semester: (Total Quality Management15AU831

CO-1	Explain basic concepts of TQM.
CO-2	Describe leadership qualities, different factors of customer satisfaction and benefits of involvement of employee in quality management
CO-3	Describe various techniques for continuous process improvement and to understands its benefits
CO-4	Apply various tools and techniques in industries to achieve the higher productivity
CO-5	Describe importance of HR dept. recruitment process, importance of training of employees
Co-6	Understand use of various graphical representation of process behavior in TQM

DEPARTMENT OF BIOTECHNOLOGY

Vision of the Department

Aspiring to be recognized as a premier source of outstanding graduates, who in turn will help their enterprise attain and sustain industrial and societal competitiveness.

Missionof the Department

To create and disseminate knowledge by being accountable for developing and motivating our pupils to attain academic excellence and industrial competency. With our focus on teaching, learning & research, we engage in helping our students to face challenges in the field of Biotechnology

Detailed Mission

M1	To embrace and disseminate fundamental and applied knowledge of Biotechnology Engineering to attain academic excellence and industrial competency
M2	To empower the students for enhanced performance through continuous learning and research capabilities in multidisciplinary domains
M3	To create awareness about professional conduct and socio-ethical implications of potentials of biotechnology
M4	To equip the students to interrelate biotechnological solutions for present day challenges

Program Specific Objectives

1: Graduates will gain and apply knowledge of Science, Biotechnology and Engineering concepts in order to design and perform the experiments followed by validating the data to solve complex problems in the multidisciplinary research fields of Biotechnology.

2: Graduates will be able to analyze, appraise and develop technologies to address the Biotechnology Engineering problems while keeping in mind safety & ethical factors to safeguard the environment and society at large.

Program Educational Objectives

1. To endow students with basics of mathematics, life sciences and engineering necessary to analyze and solve scientific problems.

2. To provide students with the necessary instructions and relevant practical experience combined with exposure to and adequate training to face basic challenges in Biotechnology.

3. To inculcate scientific temperament in students to pursue and engage in research projects related to health, food, and environment.

4. To prepare students with efficient communication skills, team spirit and leadership qualities and awareness of professional conduct and mould them into responsible and competent engineers.

5. To empower students to work in scientific environment with ethical values and social responsibilities.

Course Name: C201(Biostatistics-18BT31)

C201.1	Study and design various statistical problems
C201.2	Foundation to tackle live problems in various spheres of bioscience and bioengineering.
C201.3	Demonstrate strong basics in statistics and numerical analysis

Course Name: C202(Microbiology-18BT32)

C202.1	Describe the structure and function of typical prokaryotic and eukaryotic cell structure like bacteria, algae, yeast & molds, protozoa, viruses, etc.
C202.2	Ability to isolate, grow, identify the microorganisms.
C202.3	Study of equipment's like LAF, hot air oven, autoclave microscope etc. and their role in sterilization and understanding the mechanism of chemical based sterilization
C202.4	Learning to disinfect the microbes and to work in sterile environment.
C202.5	Define the role of microorganisms towards environmental protection, industrial applications, and infectious diseases their diagnosis and control of the spread of the disease.
C202.6	Out-line industrial fermentation processes leading to the production of antibiotics, organic acids, enzymes, vitamins, and therapeutic products.

Course Name: C203 (UnitOperations-18BT33)

C203.1	State and describe the nature and properties of the fluids
C203.2	Classify fluid systems and understand its behavior and derive equations governing fluid flow
C203.3	Study the different flow measuring instruments and demonstrate applications of Bernoulli's theorem in venturi meter, orifice meter and pumps.
C203.4	Illustrate the working of size reduction, sedimentation, and mixing equipment's.
C203.5	Understand the working of mass transfer operations and distinguish them
C203.6	Design and operate the heat exchange equipment

Course Name: C204 (Introduction to Biomolecules-18BT34)

C204.1	present the foundational principles of macromolecular structure and function
C204.2	understand the principle of high energy molecules and Photosynthesis
C204.3	Understand about biological membrane and transport mechanism across the cell membrane and analyses its regulation

Course Name: C205 (Cell Biology and Genetics-18BT35)

C205.1	Able to summarize and recollect the concepts of cell biology and understand the cell

	organelles and functions
C205.2	To Exploit and analyze the knowledge of cell division and importance of cell cycle regulation and cell locomotion
C205.3	explain the concepts of hematology and Growth factors
C205.4	understand the structure of genetic material, classical experiments, and Mendelian laws of Inheritance
C205.5	Illustrate the gene interactions, linkage, mapping, and the structure of chromosome.
C205.6	To interpret the knowledge of population genetics in brief &apply the fundamental aspects of genetics in biotechnology

Course Name: C206 (PYTHON programming-18BT36)

C206.1	Develop algorithmic solutions to simple computational problems
C206.2	Read, write, execute by hand simple Python programs.
C206.3	Structure simple Python programs for solving problems.
C206.4	Decompose a Python program into functions.

Course Name: C207(Microbiology Laboratory-18BTL37)

C207.1	To use different laboratory equipment and instruments such as Microscope, Laminar Air Flow Station, Autoclave, oven, incubators
C207.2	Prepare the media and use for the cultivation of the microorganisms.
C207.3	Perform laboratory experiments for the isolation, identification, and characterization of microorganisms
C207.4	Carry-out experiments for the enumeration, staining and control.
C207.5	Understanding the biochemical characterization of microbes to establish taxonomic classification.
C207.6	Ability to interpret the growth pattern and mechanism and correlation w.r.t industrial microbiology

Course Name: C208 (Unit Operations Laboratory-18BTL38)

C208.1	Arrive at required results based on experimental observations recorded systematically.
C208.2	Study and illustrate the working of different flow measuring instruments
C208.3	Understand and estimate the shape and size of irregular particles by sieve analysis
C208.4	Demonstrate the experimental procedure for mass transfer operation though distillation and diffusion studies.
C208.5	Study heat transfer operation in double pipe heat exchanger and compare flow

	patterns of double pipe heat exchanger
C208.6	Understand operation of centrifugal and reciprocating pumps by varying flow rates

Course Name: C209 (Stoichiometry-18BT41)

C209.1	Discuss the significance of material and energy balance for bioprocess technology.
C209.2	Solve problems related to material and energy balance to give solutions for bioprocess development.
C209.3	Develop the flowsheet for general processes operating in bioprocess industry.
C209.4	Apply the stoichiometry of microbial growth and product formation involved in bioprocess technology

Course Name: C210 (Molecular Biology-18BT42)

C210.1	Explain replication, transcription and translation processes with underlying differences in prokaryotic and eukaryotic systems
C210.2	Recognize and explain the role of enzymes and factors involved in replication, transcription, and translation
C210.3	Describe the regulation of gene expression in prokaryotes and eukaryotes and interpret its importance
C210.4	Elaborate importance of genetic recombination with special reference to bacterial system
C210.5	Categorize DNA damage occurring in living system and outline repair mechanisms
C210.6	Apply the knowledge of molecular biology in biotechnological applications

Course Name: C211(Immunotechnology-18BT43)

C211.1	Classify the immune system and summarize their functions
C211.2	Outline the molecular and cellular mechanisms involved in the development of the immune response
C211.3	Explain the regulatory mechanism involved in development of immune response
C211.4	Describe the cause, challenges and treatment for Immune System Pathologies
C211.5	Describe the cause, challenges and treatment for Immune System Dysfunctions
C211.6	Apply the major immunological laboratory techniques and their application to both clinical analysis and experimental research

Course Name: C212(Cell Culture Techniques-18BT44)

C212.1	Ability to understand the importance of equipment's a, their sterilization and usage aspects

C212.2	Able to Differentiate between the various sources of cells to be used in cell culture techniques
C212.3	Ability to Correlate between different biological samples and understand the importance of different media in tissue culture
C212.4	Ability to Comprehend the applications of plant tissue culture and their utilization.
C212.5	Ability to Comprehend the applications of animal and microbial cell culture in industry, healthcare, and environment.
C212.6	Appraise the role of biotechnology in plant, animal, and microbial sciences for sustainable eco-system & human welfare

Course Name: C213(BiochemicalThermodynamics-18BT45)

C213.1	State & describe the concepts of system, surrounding, process, laws of thermodynamics & entropy
C213.2	Explain the PVT behavior of pure fluids and derive equations of state for real gases
C213.3	Distinguish between various equations of state & their applications and analyze the thermodynamic diagrams
C213.4	Determine the importance of partial molar properties, activity co-efficient of solution & the concepts of phase equilibrium.
C213.5	Summarize vapor liquid equilibrium data for ideal solutions
C213.6	Illustrate the phase rule for reacting systems and effect of temperature, pressure on equilibrium constants

Course Name: C214(Clinical Biochemistry-18BT46)

C214.1	Able to discuss the biochemistry and pathophysiology associated with various disorders of cellular metabolism and inborn errors of metabolism.
C214.2	Able to describe the structure and function of metabolic pathways for carbohydrates, amino acids and lipids and their corresponding clinical conditions.
C214.3	Able to analyze the medical problems associated with abnormal lipoprotein and enzyme levels and therapeutic agents used to treat such disorders.
C214.4	Able to assess the clinical manifestations of renal, hepatic, pancreatic, gastric, and intestinal functions.
C214.5	Able to understand and outline the significance of hormonal systems and their corresponding disturbances.
C214.6	Able to evaluate the biochemical and clinical aspects of hematology including measurement of coagulation and thrombosis.

Course Name: C215(BiochemistryLaboratory-18BTL47)

C215.1	Able to understand and use many of the techniques and tools of biochemistry
C215.2	Able to explain the basic concepts of pH, buffers, and colorimeter
C215.3	Able to comprehend fundamental principles of biochemical research and conduct qualitative and quantitative analysis of biological samples for constituents like glucose, urea, phosphate, iron & cholesterol
C215.4	Able to evaluate the properties of important biomolecules like carbohydrates, amino acids, proteins & lipids
C215.5	Able to implement experimental protocols, and adapt them to plan and carry out simple clinical investigations to identify biomolecules based on their color reactions
C215.6	Able to develop basic laboratory skills and use apparatus to obtain reproducible data from biochemical experiments and analyze, interpret, and report the results of clinical investigations.

Course Name: C216(ImmunoTechnologyLaboratory-18BTL48)

C216.1	Learn and demonstrate the various Immunodiagnostic techniques like agglutination, precipitation, immunoelectrophoretic, qualitative analysis, ELISA, separation of Lymphocytes and Immunoblot
C216.2	Independently carry out research experiments in immunology and cell biology.

Course Name: C301(Bio-Kinetics AND Bio-Reaction-17BT51)

C301.1	Understand the different importance of kinetic and thermodynamic considerations for the choice of feed temperature in reactor systems.
C301.2	Explain the different steps in reaction mechanisms on catalytic surfaces and identify the rate determining step
C301.3	Comprehend the fundamentals of Microbial growth kinetics and its stoichiometry
C301.4	Analyze the kinetic study of enzymes and its regulation
C301.5	Develop suitable environment for microbial growth by analyzing various parameters.

Course Name: C302(Genetic Engineering & Applications-17BT52)

C302.1	Able to explain the basic concepts of gene cloning and of applications recombinant DNA technology
C302.2	Able to categorize vectors, enzymes, and nucleic acid purification strategies important for transgenic technology, gene manipulation concepts and transgene methods.
C302.3	Able to outline and assess specific techniques like PCR, hybridization & construction of libraries used in genetic engineering

C302.4	Able to appraise the different gene/DNA transfer techniques to produce transgenic organisms
C302.5	Able to comprehend various methods of producing transgenic plants and animals and engineering microbes to produce useful products like enzymes and antibiotics
C302.6	Able to formulate specific applications of genetic engineering for the welfare of mankind & society.

Course Name: C303(Immunotechnology-17BT53)

C303.1	Classify the immune system and summarize their functions
C303.2	Outline the molecular and cellular mechanisms involved in the development of the immune response
C303.3	Explain the regulatory mechanism involved in development of immune response
C303.4	Describe the cause, challenges, and treatment for Immune System Pathologies
C303.5	Describe the cause, challenges, and treatment for Immune System Dysfunctions
C303.6	Apply the major immunological laboratory techniques and their application to both clinical analysis and experimental research

Course Name: C304(Bioinformatics -17BT54)

C304.1	Students will use basic biological concepts, grounded in foundational theories, to interpret relationships among living things and to analyze and solve biological problems.
C304.2	To know the relevant online resources, databases, and software tools
C304.3	To understand the underlying concepts of Bioinformatics in disease understanding
C304.4	To be able to design for engineering proteins and genetic engineering.
C304.5	Analyze biological data using modeling, predictive and drug design methods
C304.6	The students will be familiar with tools and techniques of bioinformatics and they can apply these techniques to Health care and pharmacy industry.

Course Name: C305(AnimalBiotechnology-17BT553)

C305.1	Understand, classify & distinguish the various parameters and concepts involved in animal cell culture and media formulation.
C305.2	Execute the experimental aspects by utilizing high end equipment's
C305.3	Interpret knowledge of the recent advances in animal breeding
C305.4	Explain basic principles & techniques in genetic engineering, gene transfer technologies for animal cell lines

C305.5	Explain the contribution 'functional genomics' is making & is likely to make in animal biotechnology now & in the future
C305.6	Appraise the role of biotechnology in animal sciences for sustainable eco-system & human welfare

Course Name: C306 (Biotechnology for Sustainable Environment-17BT563

C306.1	Apply reasoning to identify the components of environmental eco systems and effect of pollutant on environment
C306.2	Characterize the various parameters for treatment of water, wastewater, and solid waste from their sources to provide valid conclusions.
C306.3	Understand the impact of recovery, recycle of the useful resources from the wastes by adopting advanced techniques to demonstrate the need for sustainable development.
C306.4	Identify and demonstrate the knowledge to use suitable equipment for abatement and control of air & noise pollution

Course Name: C307 (Genetic Engineering &ImmunoTechnology Laboratory-17BTL57)

C307.1	Categorize the blood group and analyze the sample for diagnosis of typhoid.
C307.2	Measure the concentration of antigen or antibody present in the sample by selecting the appropriate immunochemical technique and infer the results
C307.3	Choose a suitable experimental method to isolate, quantify & measure the concentration of DNA& RNA
C307.4	Demonstrate the use of PCR and prepare amplified DNA using thermal cycler
C307.5	Perform gene transformation using the appropriate method
C307.6	Analyze and identify the DNA & protein by suitable technique

Course Name: C308(Bioinformatics Lab -17BTL57)

C308.1	The students will be gaining expertise on practical data analytics, Data mining, machine learning.
C308.2	Utilize the biological information from public databases for given problem in biotechnology, medicine, or biology.
C308.3	To gain foundational knowledge about molecular evolution, protein structure and gene expression using computational tools.
C308.4	Ability to write computer programs in various programming techniques to analyze bioinformatics data
C308.5	To apply the tools to address important problems of biotechnology and to verify the capability in handling a research project.

C308.6	The students will be able to visualize data and will apply this knowledge towards analysis of data related to graphical interfaces in the fields of systems biology, functional genomics, and biomedicine

Course Name: C309(Bio-Business and Entrepreneurship -17BT61

C309.1	To understand analyze and explore entrepreneurship opportunity in biotechnology
C309.2	To Analyze societal problems and derive biotech based scientific solutions.
C309.3	To accelerate innovation and conservation of IPR
C309.4	To Explore funding opportunity for innovations and startups.
C309.5	To Exploit business opportunity through expired patent, technology learning and licensing.
C309.6	To illustrate scientific problem into a project proposal.

Course Name: C310(Bioprocess Control and Automation -17BT62

C310.1	Able to describe the Instrumentation of flow, pressure, temperature.
C310.2	Able to determine the transient response and to derive the transfer functions of first order systems and first order systems in series and to solve problems of response of first order systems for different types of input.
C310.3	Able to determine the transient response and to derive the transfer functions of second order systems.
C310.4	To Understand the parameters to be measured and controlled in the bioreactor.
C310.5	Able to apply the design aspects for block diagrams and use the concept of stability for solving the problems.
C310.6	Able to analyze online data and understand the dynamics and control of bioreactors.

Course Name: C311 (Enzyme Technology & Biotransformation-17BT63)

C311.1	Classify and identify the enzymes based on the biochemical reaction catalyzed by them
C311.2	Compare enzymes and catalyst, and explain the mechanism of enzyme catalysis
C311.3	Recognize & Interpret the importance of enzymes in medicine
C311.4	Explain the methods involved in study of enzyme kinetics,standardization, and optimization of enzyme catalyzed reactions
C311.5	Compare immobilized enzymes over conventional enzymes, apply the knowledge of immobilized enzymes in bioprocess industry
C311.6	Summarize the applications of enzymes in medicine and industry

Course Name: C312 (Bioprocess Equipment Design & CAED-17BT64)

C312.1	To define the notations and terminology for welding and pipe joints.
C312.2	To draw various values and joints.
C312.3	To calculate the no of tubes, diameter, and different parameter of double pipe heat exchanger.
C312.4	To calculate the dimensions of shell and tube heat exchangers.
C312.5	To apply the design aspects by solving the problems.
C312.6	To evaluate the no of plates & height of packing in distillation column and to design the fermenter.

Course Name: C313 (Cell Culture Techniques-17BT653)

C313.1	Ability to understand the importance of equipment's a, their sterilization and usage aspects
C313.2	Able to Differentiate between the various sources of cells to be used in cell culture techniques
C313.3	Ability to Correlate between different biological samples and understand the importance of different media in tissue culture
C313.4	Ability to Comprehend the applications of plant tissue culture and their utilization.
C313.5	Ability to Comprehend the applications of animal and microbial cell culture in industry, healthcare, and environment.
C313.6	Appraise the role of biotechnology in plant, animal, and microbial sciences for sustainable eco-system & human welfare

Course Name: C314 (Nano Biotechnology-17BT662)

C314.1	Able to understand and describe nanobiotechnology and its applications
C314.2	Able to discuss nanoparticle types and synthesis method
C314.3	Able to describe the importance and various classification of nanolithography process
C314.4	Able to describe various characterization techniques for nanoparticles
C314.5	Understand the principle and application of nano diagnostics
C314.6	Able to understand and differentiate between bio nanotechnology and nanobiotechnology

Course Name: C315 (Bioprocess Control & Automation Laboratory-17BTL67)

C315.1	To understand the characteristics of transducers of temperature, pressure & flow
C315.2	To understand determine the oxygen demand required for biological degradation of pollutant

C315.3	To analyze the response of first order systems for step and impulse input
C315.4	To interpret the response of first order systems.
C315.5	Describe the principles of controllers
C315.6	To explain the concept of control of DO& agitation

Course Name: C316 **(Biokinetics and Enzyme Technology Laboratory -17BTL68)**

C316.1	Able to apply principles of protein chemistry and enzymology for analysis and study of enzymes as biocatalysts
C316.2	Able to investigate various methods available for isolation, purification, and characterization of enzymes
C316.3	Able to apply the principles and methods of immobilization of enzymes useful in a diverse range of industries
C316.4	Able to assess biokinetics parameters using different reactors
C316.5	Able to implement experimental protocols, and adapt them to plan and carry out investigations to relate experimental data with fundamental theories of enzyme kinetics
C316.6	Able to use basic laboratory skills and apparatus to obtain reproducible data from biochemical experiments and analyze, interpret, and report the results.

Course Name: C401(Fermentation Technology -15BT71)

C401.1	To Describe the factors affecting secondary metabolite production and its industrial importance.
C401.2	To Describe the basic requirements of downstream processing for biochemical product recovery.
C401.3	To Identify and summarize the effect of change in unit's operations and its impact on the process.
C401.4	To Illustrate how emerging technologies would benefit the biochemical product recovery and show the likely benefits it would have over the traditional operations.
C401.5	To Analyzing both analytical and process validation issues that are critical to successful manufacturing
C401.6	To Outline the processes involving large-scale, high-purity protein production.

Course Name: C402(Genomics & Proteomics -15BT72)

C402.1	The students will be able to apply DNA/genome sequencing techniques to various genome projects.
C402.2	The students will be able to analyze genomes of various organisms and genome

	annotation importance.
C402.3	The students will be able to correlate the relationship between genome, transcriptome, proteome, and metabolome.
C402.4	To engineer proteins for therapeutic and clinical applications.
C402.5	The students will be able to apply the knowledge of the major web-resources and the notion about how the methods are applied in real-life scientific research.
C402.6	The students will be able to understand how to perform simple analysis of this data and remember examples of how the research tools are applied in published investigations.

Course Name: C403(Plant Biotechnology -15BT73)

C403.1	To apply tissue culture techniques for the large-scale production of various plantlets with economically useful traits
C403.2	Analyze the developments of crop production by using plant breeding and hybridization techniques.
C403.3	Apply genetically engineered concepts to induce biotic and abiotic stresses in plants
C403.4	Develop & create genetically modified plants with genes from microbial and animal origin that have diagnostic application
C403.5	Utilize the technique for the development and production of pharmaceutically important molecules as edible drugs
C403.6	Utilize and implement knowledge of mass production of plants to meet the societal demand for food

Course Name: C404(Lab to Industrial Scaling -15BT743)

C404.1	Analyze the various parameters for bioreactor design.
C404.2	Identify appropriate qualitative and quantitative analysis methods depending upon the chemical nature of analyze.
C404.3	Enhance product output by selection of appropriate method of enrichment operation
C404.4	Enhance product quality by appropriate method of purification operation
C404.5	Analyze industrial problems in fermentation process and solving.
C404.6	Designing Bioreactors using computer programming skills

Course Name: C405(Molecular Diagnostics -15BT753)

C405.1	Outline the basic concepts of health diagnostics.
C405.2	Explain the role & importance DNA-based and PCR-based diagnostic methods.

C405.3	Describe the diagnosis of disorders such as haemoglobinopathies, mucopolysaccharidoses, lipidoses, amyloidosis using biochemical & cell-based assays.
C405.4	Identify the different immunodiagnostics & imaging diagnostic techniques.
C405.5	Explain the different ways of product & assay development methods.
C405.6	Describe the application of biosensors in diagnostics.

Course Name: C406(Fermentation Technology Laboratory -15BTL76)

C406.1	Analyze and select appropriate unit operations for isolation and purification of bio molecules.
C406.2	Evaluate the bio-product using appropriate qualitative and quantitative analysis methods depending upon the chemical nature of analyte.
C406.3	Analyze, compare, and select a technique for concentrating biological products like extraction, drying, filtration, precipitation, membrane separation.
C406.4	Acquire the basic principles and techniques of chromatography to purify the biological products.
C406.5	Describe the basic principles of fermentation preparation and the requirements of downstream processing for biochemical product recovery.
C406.6	Analyze the kinetics and estimation of product produced using fermenter

Course Name: C407(Plant Biotechnology Laboratory -15BTL77)

C407.1	To explain the basic concepts of plant biotechnology in plant tissue culture
C407.2	To describe the various components of plant tissue culture media, like minerals, growth factors, hormones, and their significance
C407.3	To relate the various steps taken to establish and optimize media for purposes
C407.4	Explain and perform some of the more advanced techniques, e.g., embryo culture and protoplast isolation and regeneration
C407.5	To establish and maintain plants in tissue culture and micro propagation, including morphogenesis
C407.6	To adapt and apply plant tissue culture techniques to research problems in plant biology

Course Name: C408(Clinical & Pharmaceutical Biotechnology -15BT81)

C408.1	To Explain the significance of pharmaco-kinetic models
C408.2	To Explain the significance of pharmaco-dynamic principles
C408.3	To understand various dosage forms and formulation

C408.4	To Understand the specific techniques used in biotherapy & clinical Biotechnology
C408.5	Comprehend specific applications of pharmaceutical & clinical Biotechnology
C408.6	Able to implement experimental protocols, and adopt to plan and carry out pre-clinical& clinical investigations

Course Name: C409(Regulatory Affairs in Biotech Industry -15BT82)

C409.1	To educate students about regulatory rules governing biotech industry
C409.2	To create awareness about guidelines that specify parameters of the safety and quality standards in the biotech industry
C409.3	Outline the importance of the quality and compliance in the biotech industry
C409.4	Comprehend the various regulatory guidelines and rules as well as the organizations governing the same.
C409.5	To learn the documentation process pertaining to quality management, QA, quality policy and marketing.
C409.6	To understand the importance of quality auditing, process designing, validating master plans & commissioning

Course Name: C410(Metabolic Engineering -15BT832)

C410.1	To empower the students with the knowledge on metabolic engineering.
C410.2	To understand the basic concepts about enzymology
C410.3	Outline and understand the basics followed in primary and secondary metabolites biosynthesis.
C410.4	Understand the importance of bioconversions of substances into products.
C410.5	Understand the concepts involved in regulation of enzyme production
C410.6	Understand the technique involved in strain improvement with interest to develop it for industrial fermentation use

Course Name: C411(Project Work -15BT85)

C411.1	Identify a topic in relevant areas of Biotechnology
C411.2	Illustrate literature review to identify gaps and define objectives & scope of the work.
C411.3	Formulate the problem to meet the objectives of the proposed work
C411.4	Develop a prototypes/models, fabrication, experimental set-up/software systems necessary to meet the objectives
C411.5	Develop the work with a concern for society, environment, and ethics
C411.6	Analyze and discuss the results to draw valid conclusions.

Course Name: C412(Seminar -15BT86)

C412.1	Enables to update with present technologies and trends in real world
C412.2	Enables to improve ability of data collection and presentation
C412.3	Enables to overcome stage fear and improve communication skills
C412.4	Enables to face spontaneous queries
C412.5	Prepare and write the report as per recommended format.
C412.6	Help to develop vocabulary & demonstrate efforts put in comprehensive analysis & interpretation of data

Department of Chemistry

Vision of the Institute

To be a respected and most sought after engineering educational institution engaged in equipping individuals capable of building learning organizations in the new millennium.

Mission of the Institute

To develop competent students with good value systems and face challenges of the continuously changing world.

Vision of the Department

Our vision is to give our students an in-depth exposure to the latest developments in Chemistry made by reputed scientists and experts in this field. To equip individuals capable of earning in the new millennium.

Mission of the Department

Our mission is to provide a contemporary foundation for addressing problems in Chemistry. Also, to develop competent engineers with good values and to equip them to face the challenges of the continuously changing world.

Program Educational Objectives

PEO 1. Mater the basic knowledge of Engineering Chemistry for building technical Competence in industries, research, and development.

PEO 2. To develop knowledge in the fields of use of free energy in chemical Equilibrium, electrochemistry and energy storage systems, corrosion, and metal finishing.

PEO 3. To understand the importance of the energy systems, environmental   pollution, waste management, water chemistry, Instrumental methods of analysis and nano-materials.

Program Specific Objectives

PSO 1: Understand the principles of electrochemistry & battery technology.

PSO 2: Apply the knowledge of Corrosion and metal finishing in solving environmental issues.

PSO 3: Utilize the knowledge of fuels and solar energy for various Engineering applications.

PSO 4: Utilize the knowledge of   water technology for various engineering applications as wellas in daily life.

PSO 5: Develop solutions for problems associated with Nano technology.

Course Name: 18CHE12/22 (ENGINEERING CHEMISTRY) -18CHE12/22

CO$_1$	Understanding the concept of free energy in equilibrium, rationalize bulk properties and processes using thermodynamic considerations.
CO$_2$	Apply the k knowledge of corrosion and electrochemical energy systems to modify surface properties of metals, to develop resistance to corrosion, wear, tear, impact etc. by electroplating and electroless plating.
CO$_3$	Understanding the difference between electrochemical cell, concentration cell, batteries, and fuel cell, and know its applications for the industrialization of country. Water chemistry and problems and types of water and various ways to make it
CO$_4$	Applying the knowledge of environmental pollution and waste management in controlling pollution.
CO$_5$	Understanding the different techniques of instrumental analysis.
CO6	To know the fundamental principles of Nanomaterials for building technical competence in industries and research.

Department of Civil Engineering

Vision of the Institute

To be a respected and most sought after engineering educational institution engaged in equipping individuals capable of building learning organizations in the new millennium.

Vision of the Institute

To develop competent students with good value systems and face challenges of the continuously changing world.

Vision of the Institute

To impart very high-quality education to the students to make them do innovative sustainable engineering relevant to industry and people at large.

Mission of the Department

Mission 1. To emphasize on basics of engineering as well as their applications relevant to the industry.

Mission 2. To serve the society with due consideration of economy, ecology and ethical issues of nation.

Mission 3. To sensitize the students and faculty to take up research and consultancy to be on par with international standards.

Program Educational Objectives

PEO 1. Apply fundamental concepts of civil engineering in developing economically viable and sustainable sound solutions.

PEO 2. To work collaboratively on multidisciplinary problems.

PEO 3. To achieve their professional aims keeping good ethics.

Program Specific Objectives

PSO 1: To apply technical skills and modern engineering tools for civil engineering day to day practice.

PSO 2: To participate in critical thinking and problem solving of civil engineering field that needs analytical and design requirements.

PSO 3: To pursue lifelong learning and professional development to face the challenging and emerging needs of our society.

Course Name:232.1(Strength of Materials-18CV32)

C232.1	To understand the basic material properties of structural materials such as steel, aluminum, wood and their combinations under axial tension and compression.
C232.2	To learn methods of stress analysis after determining the internal forces under axial tension and compression, bending, shear and torsion.
C232.3	To evaluate the behavior and strength of structural elements under the action of compound stresses and thus understand failure criteria.
C232.4	To understand the methods of analyses of design of structural frames such as pin jointed trusses and portal frames both determinate and indeterminate.
C232.5	To understand the basic concept of instability analyses of structural elements such as columns and struts.
C232.6	To understand the basic concepts of torsion developed in circular shaft.

Course Name: 233.1(FLUIDS MECHANICS-18CV32)

C233.1	Possess a sound knowledge of fundamental properties of fluids and fluid continuum
C233.2	Compute and solve problems on hydrostatics, including practical applications
C233.3	Apply principles of mathematics to represent kinematic concepts related to fluid flow
C233.4	Apply fundamental laws of fluid mechanics and the Bernoulli's principle for practical applications
C233.5	Compute the discharge through pipes and over notches and weirs

Course Name: 234.1(BASIC SURVEYING -18CV34)

C234.1	Possess a sound knowledge of fundamental principles Geodetics[L1] [PO1]
C234.2	Measurement of vertical and horizontal plane, linear and angular dimensions to arrive at solutions to basic surveying problems.
C234.3	Capture geodetic data to process and perform analysis for survey problems
C234.4	Analyze the obtained spatial data and compute areas and volumes. Represent 3D data on plane figures as contours

Course Name: 235.1 (ENGINEERING GEOLOGY -18CV35)

C235.1	Students will be able to apply the knowledge of geology and its role in Civil Engineering
C235.2	Students will effectively utilize earth's materials such as mineral, rocks and water in civil engineering practices.
C235.3	Analyze the natural disasters and their mitigation.
C235.4	Assess various structural features and geological tools in ground water. exploration, Natural resource estimation and solving civil engineering problems
C235.5	Apply and asses use of building materials in construction and asses their properties

Course Name: 236.1 (Building Materials and Construction-18CV36)

C236.1	Select suitable materials for buildings and adopt suitable construction techniques.
C236.2	Adopt suitable repair and maintenance work to enhance durability of buildings.

Course Name: C242 (Analysis of Determinate Structures (18CV42

C242.1	To evaluate the forces in determinate trusses by method of joints and sections.
C242.2	To evaluate the deflection of cantilever, simply supported and overhanging beams by different methods
C242.3	To understand the energy principles and energy theorems and their applications to determine the deflections of trusses and bent frames.
C242.4	To determine the stress resultants in arches and cables.
C242.5	To understand the concept of influence lines and construct the ILD diagram for the moving loads.
C242.6	To know the comparison between moment area and conjugate beam method.

Course Name: C243(applied hydraulics 18CV43)

C243.1	Apply dimensional analysis to develop mathematical modeling and compute the parametric values in prototype by analyzing the corresponding model parameters
C213.2	Design the open channels of various cross sections including economical channel sections
C213.3	Apply Energy concepts to flow in open channel sections, Calculate Energy dissipation,
C213.4	Compute water surface profiles at different conditions
C213.5	Design turbines for the given data, and to know their operation characteristics under different operating conditions
C213.6	The working principles of the hydraulic machines for the given data and analyzing the performance of Turbines for various design data.

Course Name:C244 (concrete technology18CV44)

C244.1	Relate material characteristics and their influence on microstructure of concrete.
C244.2	Distinguish concrete behavior based on its fresh and hardened properties
C244.3	Illustrate proportioning of different types of concrete mixes for required fresh and hardened properties using professional codes.
C244.4	Adopt suitable concreting methods to place the concrete based on requirement.
C244.5	Select a suitable type of concrete based on specific application.
C244.6	Describe the physical & mechanical properties of aggregates

Course Name: C245 (Applied geotechnical Engineering 18CV45)

C245.1	Will acquire an understanding of the procedures to determine index properties of any type of soil, classify the soil based on its index properties
C245.2	Will be able to determine compaction characteristics of soil and apply that knowledge

C245.3	Will be able to determine permeability property of soils and acquires conceptual knowledge about stresses due to seepage and effective stress; Also acquire ability to estimate seepage losses across hydraulic structure
C245.4	Will be able to estimate shear strength parameters of different types of soils using the data of different shear tests and comprehend Mohr-Coulomb failure theory.
C245.5	Ability to solve practical problems related to estimation of consolidation settlement deposits also time required for the same.
C245.6	To implement the knowledge attained in solving civil engineering problems of making roads, townships etc.

Course Name: C246 (Advanced Surveying 18CV46)

C246.1	Apply the knowledge of geometric principles to arrive at surveying problems
C246.2	Use modern instruments to obtain geo-spatial data and analyze the same to appropriate engineering problems.
C246.3	Capture geodetic data to process and perform analysis for survey problems with the use of electronic instruments;
C246.4	Design and implement the different types of curves for deviating type of alignments.
C246.5	To apply basic principles in analyzing position of celestial bodies
C246.6	To implement the knowledge attained in solving civil engineering problems of making roads, townships etc.
C245.1	Will acquire an understanding of the procedures to determine index properties of any type of soil, classify the soil based on its index properties
C245.2	Will be able to determine compaction characteristics of soil and apply that knowledge to assess field compaction procedures
C245.3	Will be able to determine permeability property of soils and acquires conceptual knowledge about stresses due to seepage and effective stress; Also acquire ability to estimate seepage losses across hydraulic structure
C245.4	Will be able to estimate shear strength parameters of different types of soils using the data of different shear tests and comprehend Mohr-Coulomb failure theory.
C245.5	Ability to solve practical problems related to estimation of consolidation settlement deposits also time required for the same.
C245.6	To implement the knowledge attained in solving civil engineering problems of making roads, townships etc.

Course Name: C351 (Design of RC Structural Elements) 17CV52)

C252.1	Determine the moment in indeterminate beams and frames having variable moment of inertia and subsidence using slope defection method
C252.2	Determine the moment in indeterminate beams and frames of no sway and sway using moment distribution method.
C252.3	Construct the bending moment diagram for beams and frames by Kani's method.
C252.4	Construct the bending moment diagram for beams and frames using flexibility

	method
C252.5	Analyze the beams and indeterminate frames by system stiffness method

Course Name: C253: Applied Geotechnical Engineering-(17CV53)

C253.1	To evaluate the forces in determinate trusses by method of joints and sections.
C253.2	To evaluate the deflection of cantilever, simply supported and overhanging beams by different methods
C253.3	To understand the energy principles and energy theorems and their applications to determine the deflections of trusses and bent frames.
C253.4	To determine the stress resultants in arches and cables.
C253.5	To understand the concept of influence lines and construct the ILD diagram for the moving loads.

Course Name: C254 Computer Aided Building Planning and Drawing(17CV54)

C254.1	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
C254.2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
C254.3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
C254.4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
C254.5	Capable of estimating load carrying capacity of single and group of piles

Course Name: C355(Air pollution and Control (17CV551)

C355.1	Identify the major sources of air pollution and understand their effects on health and environment.
C355.2	Evaluate the dispersion of air pollutants in the atmosphere and to develop air quality models.
C355.3	Ascertain and evaluate sampling techniques for atmospheric and stack pollutants.
C355.4	Choose and design control techniques for particulate and gaseous emissions.

Course Name: C356(Traffic Engineering-(17CV561)

C356.1	Understand the human factors and vehicular factors in traffic engineering design.
C356.2	Conduct different types of traffic surveys and analysis of collected data using statistical concepts.
C356.3	Use an appropriate traffic flow theory and to comprehend the capacity & signalized intersection analysis.
C356.4	Understand the basic knowledge of Intelligent Transportation System.

Course Name: C361 (Construction Management & Entrepreneurship 17CV61)

C361.1	Understand the construction management process.
C361.2	Understand and solve variety of issues that are encountered by every professional in discharging professional duties.
C361.3	Fulfil the professional obligations effectively with global outlook
C361.4	Create a construction project and safety plan
C361.5	Apply construction management skills as a member of a multi-disciplinary team.
C361.6	To make them understand the concept of project management for planning and execution.

Course Name: C262 (Design of Steel Structural Elements 17CV62)

C362.1	Possess knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions.
C362.2	Possess knowledge of Plastic behavior of structural steel.
C362.3	Understand the Concept of Bolted and Welded connections,
C362.4	Understand the Concept of Design of compression members, built-up columns and columns splices.
C362.5	Understand the Concept of Design of tension members, simple slab base and gusseted base.
C362.6	Understand the Concept of Design of laterally supported and un-supported steel beams.

Course Name:C263 (Highway Engineering 17CV63)

C363.1	Acquire knowledge of different modes of transportation systems, history, development of highways and the organizations associated with research and development of the same in INDIA.
C363.2	Acquire the capability of proposing a new alignment or re-alignment of existing roads, conduct necessary field investigation for generation of required data.
C363.3	Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction.
C363.4	Design road geometrics, structural components of pavement
C363.5	Design of highway drainage structural elements
C363.6	Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway financing concepts.

Course Name: C264 (Water Supply and Treatment Engineering 17CV64)

C364.1	Estimate average and peak water demand for a community.
C364.2	Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community.
C364.3	Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.

C364.4	Design a comprehensive water treatment and distribution system to purify and distribute water to the required quality standards.
C364.5	Study drinking water quality standards and to illustrate qualitative analysis of water
C364.6	Design physical, chemical and biological treatment methods to ensure safe and potable water Supply. Revise

Course Name:C265 (Solid Waste Management 17CV651)

C365.1	Analyze existing solid waste management system and to identify their drawbacks
C365.2	Evaluate different elements of solid waste management system.
C365.3	Suggest suitable scientific methods for solid waste management elements.
C365.4	Design suitable processing system and evaluate disposal sites.
C365.5	Analyze different processing technologies and to study conversion of municipal solid waste to compost or biogas.
C365.6	Evaluate landfill site and to study the sanitary landfill reactions.

Course Name:C261 (Water Resources Management 17CV661)

C3661.1	Assess the potential of groundwater and surface water resources.
C3661.2	Address the issues related to planning and management of water resources.
C3661.3	Know how to implement IWRM in different regions.
C3661.4	Understand the legal issues of water policy.
C3661.5	Select the method for water harvesting based on the area.
C3661.6	Understand the importance of water and manage the water resources effectively.

Course Name: C471 (MIWW-(15CV71)

C471.1	Acquires capability to design sewer and Sewerage treatment plant.
C471.2	Evaluate degree of treatment and type of treatment for disposal, reuse and recycle.
C471.3	Identify waste streams and design the industrial wastewater treatment plant.
C471.4	Manage sewage and industrial effluent issues.

Course Name: C472 Design of RCC and Steel Structures15CV72)

C472.1	Understand the importance of hydrology and its components.
C472.2	Measure precipitation and analyze the data and analyze the losses in precipitation.
C472.3	Estimate runoff and develop unit hydrographs.
C472.4	Find the benefits and ill-effects of irrigation.
C472.5	Find the quantity of irrigation water and frequency of irrigation for various crops. loads.
C472.6	Find the canal capacity, design the canal and compute the reservoir capacity.

Course Name: C473 Hydrology and Irrigation Engineering(15CV73)

C473.1	Understand the importance of hydrology and its components.

C473.2	Measure precipitation and analyze the data and analyze the losses in precipitation.
C473.3	Estimate runoff and develop unit hydrographs.
C473.4	Find the benefits and ill-effects of irrigation.
C473.5	Find the quantity of irrigation water and frequency of irrigation for various crops. loads.
C473.6	Find the canal capacity, design the canal, and compute the reservoir capacity.

Course Name 474 Ground Water & Hydraulics (15CV74)

C474.1	find the characteristics of aquifers.
C474.2	estimate the quantity of ground water by various methods.
C474.3	locate the zones of ground water resources.
C474.4	select particular type of well and augment the ground water storage.

Course Name:475 (Urban Transportation and Planning-15CV755)

C475.1	Design, conduct and administer surveys to provide the data required for transportation planning.
C475.2	Supervise the process of data collection about travel behavior and analyze the data for use in transport planning.
C475.3	Develop and calibrate modal split, trip generation rates for specific types of land use developments.
C475.4	Adopt the steps that are necessary to complete a long-term transportation plan.

course Name:C481(Quantity Surveying and Contracts Management 15CV81)

C481.1	. Prepare detailed and abstract estimates for roads and building.
C481.2	Prepare valuation reports of buildings
C481.3	Interpret Contract documents of domestic and international construction works
C481.4	Estimate the quantities of work, develop the bill of quantities, and arrive at the Cost of civil engineering Project
C481.5	Understand and apply the concept of Valuation for Properties
C481.6	Understand, Apply and Create the Tender and Contract document

Course Name:C482 Design of Pre-Stressed Concrete Elements 15CV82)

C482.1	Understand the requirement of PSC members for present scenario
C482.2	Analyze the stresses encountered in PSC element during transfer and at working
C482.3	Understand the effectiveness of the design of PSC after studying losses
C482.4	Capable of analyzing the PSC element and finding its efficiency.
C482.5	Design PSC beam for different requirements
C482.6	learn Design of Pre-Stressed Concrete Element

Course Name: C483 (Pavement Design 15CV833)

C483.1	Gain knowledge about the process of collecting data required for design, factors

	affecting pavement design, and maintenance of pavement.
C483.2	Systematically generate and compile required data for design of pavement (Highway & Airfield).
C483.3	Analyse stress, strain and deflection by bossiness's, bur mister's and Vestergaard's theory.
C483.4	Design rigid pavement and flexible pavement conforming to IRC58-2002 and IRC37-2001.
C483.5	Understand the requirements of various types of joints in pavements, which are provided to take care of climatic variations.
C483.6	Evaluate the performance of the pavement and develops maintenance statement based on site specific requirements.

Department of Computer Science Engineering

Vision of the Institute

To be a respected and most sought after engineering educational institution engaged in equipping individuals capable of building learning organizations in the new millennium.To produce technocrats with creative technical knowledge and intellectual skills to sustain and excel in the highly demanding world with confidence.

Mission of the Institute

To develop competent students with good value systems and face challenges of the continuously changing world.

Vision of the Department

To produce technocrats with creative technical knowledge and intellectual skills to sustain and excel in the highly demanding world with confidence.

Mission of the Department

Mission 1. The department's aim is to develop the best computer science professionals who work creatively, communicate effectively & become technologically competent, and to mould them into good citizens by inculcating sense of ethical values in them.

Mission 2. To Encourage the students to build self-help, Power of initiative, courage to change and create new things.

Mission 3. To inculcates the spirit of cooperation and capacity for organization with special emphasis on their self-reliance and sustainability to meet ever changing requirements of local and global industries.

Program Educational Objectives

PEO 1.   To create graduates equipped with life-long learning skills and have a   successful professional career in IT industry.

PEO 2.   To prepare graduates to pursue higher education and get inclined towards research & development in computer science engineering.

PEO 3.   To provide adequate training and opportunities, with exposure to emerging cutting-edge technologies and to work in teams on multidisciplinary projects with effective communication skills and leadership qualities.

Program Specific Objectives

PSO 1: To design efficient algorithms and develop effective code for real-time computations.

PSO 2: To apply software engineering principles in developing optimal software solutions.

Course Name:C231 (Transform Calculus, Fourier Series and Numerical Technique-18MAT31)

C231.1	Solving differential/ integral equation arising in network analysis, control systems and other fields of engineering by Laplace transform and inverse Laplace transform
C231.2	Employ Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field theory.
C231.3	Analyze the concept of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals, and systems.
C231.4	To solve the first and second order ordinary differential equations arising in engineering problems make use of single step and multistep numerical methods.

Course Name:C232 (Data Structures and Applications-18CS32)

C232.1	Use different types of data structures, algorithms, and their operations.
C232.2	Apply searching, sorting operation on files.
C232.3	Analyze the usage of stack, Queue, List, Trees and Graphs in problem solving.
C232.4	Use the hash function, concepts of collision and its resolution methods.

Course Name:C233 (Data Structure in C-18CS33)

C233.1	Comprehend/Perceivetheworkingprinciplesoffundamentalbuildingblocksofanalog and Digital Systems.
C233.2	Develop truth tables, switching equations, state tables and diagrams for given clocked.sequential circuits.
C233.3	Apply the knowledge of principles of Digital System Design in designing combinational. andSynchronous/Asynchronoussequentiallogiccircuits.
C233.4	Applytheknowledgeofsemiconductordevicesandcircuitstodeterminecircuitparametersandmathematical expressions for the same.

Course Name:C234 (Unix And Shell Programming-18CS34)

C234.1	Apply the basic concepts of sub system of a computer and machine instructions.
C234.2	Apply different algorithms used to perform arithmetic and logic operations.
C234.3	Analyze the importance of pipelining and processing unit.
C234.4	Analyze how to measure and improve the memory performance.

Course Name:C235 (Discrete Mathematical structures-18CS35)

C235.1	Apply software engineering technologies and ethics in professional responsibility.
C235.2	Apply software engineering practice over the entire software system life cycle.
C235.3	Analyze process activities for different software process models and system models.
C235.4	Analyze thetechniques, skills, and modern engineering tools necessary for engineeringpractice.

Course Name:C236 (Discrete Mathematicalstructures-18CS36)

C236.1	Examine the correctness of an argument using propositional and predicate logic and truth tables. Construct proofs using direct proof, proof by contradiction,
C236.2	Apply the Knowledge to solve problems using counting techniques and combinatorics and application of different mathematical proofs techniques in proving theorems.
C236.3	Solve the problems using recurrence relations and generating functions. Also analyze the concept of discrete probability recursion.
C236.4	Use the knowledge of graphs theory and contrast the various types of graphs, trees and their applications.

Course Name:C241 (Engineering Mathematics-IV-17CS41)

C241.1	Understand the basic concept of complex variables,distribution, and special functions to solve mathematical problems.
C241.2	Apply the knowledge of numerical methods, sampling distribution tosolve complex engineering problems.
C241.3	Analyze the probability distribution, sampling distribution and complexVariable through analytic function, Cauchy-Riemann equations, residues, Bilinear transformation for signal processing.
C241.4	Evaluate first and second order ordinary differential equations throughsingle and multi-step method problems.

Course Name:C242 (Object Oriented Concepts-17CS42)

C242.1	Understand and Apply Object Oriented Programming concepts of C++ and java.
C242.2	Apply Object oriented concepts of C++ and java to solve simple problems.
C242.3	Analyze event driven simple GUI programs using java applets and swings.

Course Name:C243 (Design and Analysis Of Algorithms-17CS43)

C243.1	Understand the analysis framework and computational solution to well-known problems with suitable data structure.
C243.2	Apply appropriate design strategies for problem solving.
C243.3	Analyze the performance of different algorithms.
C243.4	Design an efficient algorithm using appropriate design strategies for problem solving.

Course Name:C244 (Microprocessor and Microcontroller-17CS44)

C244.1	Understand the architecture and ARM processor and apply instruction set to process data.
C244.2	Apply suitable addressing modes, instructions, and interrupt functions for data processing.
C244.3	Analyze memory and Input Output interfacing for data transferring.

C244.4	Design memory address decoders and assembly language program for simple applications.

Course Name:C245 (Software Engineering-17CS45)

C245.1	Understand the software engineering technologies and apply in software development.
C245.2	Apply software engineering practice over the entire software system life cycle.
C245.3	Analyze process activities for different software process models and system models.
C245.4	Evaluate high-level and low-level design of an application from the identified software requirements.

Course Name:C246 (Data Communication-17CS46)

C246.1	Understand and apply the basic concepts of Data Communication and technologies
C246.2	Apply the appropriate methods and protocol suites to address the different data communication issues
C246.3	Analyze the significance of data network components
C246.4	Evaluate the functionalities of various layer protocols and network devices

Course Name:C351 (Management, Entrepreneurship for It Industry-17CS51)

C351.1	Understand the basic concepts of management functions, projects, ERPand outline their importance in entrepreneurship.
C351.2	Analyze the business opportunities, appropriate leadership
C351.3	Evaluate the importance of SSIs in economic development and itsinstitutional support provided by government of India.
C351.4	Estimate the importance of IPRs and cyber-law to protect infringementof secret document.

Course Name:C352 (Computer Networks-17CS5)

C352.1	Understand the fundamentals of application layer, transport layer, network layers and apply the various protocols for datacommunication.
C352.2	Apply mobile, multimedia networking and network managementmechanisms for data transfer.
C352.3	Analyze the difference between various routers addressclasses, RoutingAlgorithms, and compute shortest paths.
C352.4	Evaluate the suitability of data transfer protocols for transport layerservices.

Course Name:C353 (Database Management System-17CS53)

C353.1	Apply the physical structure of the database to handle data, to define a problem at the view level.
C353.2	Apply the basics knowledge of relation algebra and SQL to constructqueries.
C353.3	Analyze the concepts of Normalization and Transaction Managementto structure the database.

C353.4	Examine Functional Dependencies, concurrency control, recovery, and security in formulating a familiar database for real world problem.

Course Name:C354 (Automata Theory and Computability-17CS54)

C354.1	Understand and apply the fundamental concepts of Automata theory and Computability.
C354.2	Apply analytical principle and fundamentals for different language classes.
C354.3	Analyze models of computation like Deterministic, Non-deterministic and software models for a given problem.
C354.4	Analyze the problem under study through formal reasoning and reduction techniques

Course Name:C355 (Object Oriented Modeling and Design-17CS55)

C355.1	Understand and apply the concepts of Object Oriented (OO) modelsand Design Pattern.
C355.2	Analyze the application Domain and Prepare models from differentviewpoints.
C355.3	Design and draw class diagram, sequence diagrams and interactiondiagrams for any software systems.
C355.4	Choose and apply design pattern for software applications

Course Name:C356 (.Net Framework for Application Devt-17CS56)

C356.1	Understanding visual studio .NET platform, syntax, and semantics of c#and applying framework tools efficiently.
C356.2	Analyze the object-oriented programming concepts in c# programminglanguage.
C356.3	Design custom interfaces for windows form applications by usingcontrols.
C356.4	Develop window form applications using c# programming language to resolve a given problems.

Course Name:C361 (Cryptography, Network security and Cyber law-17CS61)

C361.1	Understand the fundamentals of cryptography, network security, cyber laws and apply the cryptographic techniques for various ciphers.
C361.2	Apply principal concepts to solve a given problem under study.
C361.3	Investigate malwares, file infectors to check for viruses and bugs to eliminate the same.
C361.4	Evaluate the performance of different cryptographic techniques.

Course Name:C362 (File Structures-17CS62)

C362.1	Identify the appropriate concept of file structure design and secondary storage devices.
C362.2	Apply appropriate designs for storage and data manipulation with object-oriented programming.
C362.3	Analyze sorting, indexing, and hashing technique for data handling.
C362.4	Identify the appropriate concept of file structure design and secondary storage

	devices.

Course Name:C363 (Software Testing-17CS63)

C363.1	Understand the concepts of testing and apply to derive different testcases
C363.2	Apply the different testing techniques
C363.3	Analyze the appropriate testing techniques in classifying the problems
C363.4	Create appropriate document for the software artifact

Course Name:C364 (Operating Systems-17CS64)

C364.1	Understand fundamentals of operating systems and applyingalgorithms to solve given problems.
C364.2	Analyze process scheduling and process synchronization
C364.3	Apply suitable techniques for management of different resources.
C364.4	Compare various operating system platforms through case studies.

Course Name:C365 (Data Mining and Data Warehouse-17CS65)

C365.1	Understand the applicability of fundamental concepts of datawarehouse and data mining
C365.2	Apply classification and clustering algorithms for various problems
C365.3	Analyze the suitability of association rules for a given data pattern

Course Name:C366 (Python Application Programming-17CS66)

C366.1	Understand and apply the fundamentals of python programming language.
C366.2	Apply procedure and object-oriented concepts of python to solve simple problems.
C366.3	Analyze python program for Network Programming, Web services and Database applications.
C366.4	Understand and apply the fundamentals of python programming language.

Course Name:C371 (Web Technology and Its Applications-17CS71)

C371.1	Understand and apply the syntax, semantics of HTML and CSS.
C371.2	Apply basics to create forms and tables.
C371.3	Analyze JavaScript frameworks jQuery, Backbone MVC, AJAX and web services.
C371.4	Evaluate dynamic web pages using JavaScript and PHP.

Course Name:C372 (Software Architecture and Design Pattern-17CS72)

C372.1	Understand the range of design patterns and applying appropriate patterns to solve the given problem.
C372.2	Analyze various components of object-oriented system and patterns.
C372.3	Apply design principles in the design of object-oriented systems and distributed systems.
C372.4	Design and model object-oriented systems using different types of pattern.

Course Name:C373 (Machine Learning-17CS73)

C373.1	Understand the applicability of fundamental concepts, algorithms, andassociated procedures of machine learning.
C373.2	Apply the basic concepts of mathematics and machine learning tounderstand Supervised, unsupervised and reinforcement learning algorithms.
C373.3	Analyze the usage of neural networks, Bayes classifier and k nearestneighbor for given problem under study to infer its efficacy.
C373.4	Evaluate the statistics to infer the correctness of the written machinelearning algorithm for a given application.

Course Name:C374 (Unix System Programming-17CS74)

C374.1	Understand UNIX, ANSI, POSIX standards and apply file APIs to process files.
C374.2	Apply process concepts to demonstrate inter-process communications.
C374.3	Analyze Signal and Daemon processes for process controlling.

Course Name:C375 (Storage Area Networks-17CS75)

C375.1	Understand the fundamentals and applications of Storage area Network including storage architectures and storage networking techniques.
C375.2	Apply different techniques to provide business continuity capabilitiesand disaster recovery.
C375.3	Identify key challenges in virtualization and cloud computing.
C375.4	Analyze the suitable RAID technology for different application environments.

Course Name:C381 (Internet of Things Technology-17CS81)

C381.1	Apply the fundamental concepts of IOT architectural models, IOTnetwork protocols and hardware and software tools
C382.2	Apply suitable IOT protocols for given network under study.
C383.3	Analyze the data Analytics in IOT to infer the security issue related tothe IOT network.
C384.4	Evaluate the correctness of the chosen hardware and software tools tobe used in constructing IOT model.

Course Name:C382 (Object System Simulation and Modeling-17CS82)

C382.1	Understand the basic concepts of warehousing, mining and apply Hadoop Distributed File System commands to manage data.
C382.2	Apply algorithms of warehousing, mining, and Hadoop Distributed File System for data analysis.
C382.3	Analyze Regression, Clustering, Artificial Neural Networks and Decision tree techniques for decision making.
C382.4	Evaluate different techniques of Mining, Association and Mapreduce framework.

Course Name:C383 (Big Data Analytics-17CS83)

C383.1	Describe the role of important elements of discrete event simulationand apply modeling paradigm.
C383.2	Apply functional modeling methods for statistical system activities toconceptualize real world situations.
C383.3	Analyze the modeled simulation results to resolve critical issues in areal-world environment
C383.4	Evaluate the simulation models using verification and validationmethods

Course Name:C384 (Internship / Professional Practise-17CS84)

C384.1	Understand the key concerns, practices, Standard operating procedures protocols and new concepts of the company/ industry in which they haveworked.
C384.2	Apply hands on experience, communication, interpersonal and other critical skills to integrate theory and practice in multidisciplinary area.
C384.3	Manage time, Analyze the skills which are transferable to new contexts and identify which appropriate engineering technology could be used to solve given problem.
C384.4	Understand the key concerns, practices, Standard operating procedures protocols and new concepts of the company/ industry in which they haveworked.

Department of Electronics and Communication Engineering

Vision of the Institute

To be a respected and most sought after engineering educational institution engaged in equipping individuals capable of building learning organizations in the new millennium.

Mission of the Institute

To develop competent students with good value systems and face challenges of the continuously changing world.

Vision of the Department

To impart technical education par excellence and prepare leaders to serve the industries and society.

Mission of the Department

Mission 1. To Provide the world with a highly committed and quality conscious engineering workforce.

Mission 2. To Encourage the students to build self-help, Power of initiative, courage to change and create new things.

Mission 3. To inculcate the spirit of cooperation and capacity for organization with special emphasis on their self-reliance and sustainability tomeet ever changing requirements of local and global industries.

Program Educational Objectives

PEO 1. Graduates apply their knowledge of mathematics and science to identify, analyze and solve problems in the field of Electronics & communication to develop sophisticated communication systems.

PEO 2. Graduates to design and build up interdisciplinary systems by solving core engineering problems in communication systems which are technically sound, economically feasible and socially acceptable.

PEO 3. Graduates exhibit desire for life-long learning which directs them to obtain thorough knowledge in their chosen fields and motivate them for higher studies/research.

Program Specific Objectives

PSO 1: An ability to understand the basic core courses of Electronics & Communication Engineering and to relate them to various areas of application like Communication Systems, control system, Signal processing, VLSI and Embedded systems.

PSO 2: Should have capability to apply modern tools to analyze and solve complex designs with optimal solutions for various real-world applications.

PSO 3: Excellent adaptability to changing work environment with good leadership qualities and zeal for social and environmental well-being.

Course Name: C104 (Basic Electronics-18ELN14/24)

C104.1	Describe the operation of diodes, BJT, FET and operational amplifiers
C104.2	Design and explain the construction of rectifiers, regulators, amplifiers, and oscillators
C104.3	Describe general operating principles of SCRs and its application
C104.4	Explain the working and design of fixed voltage IC regulator using 7805 and a stable oscillator using Timer IC555.
C104.5	Explain the different number systems and their conversions and construct simple combinational and sequential logic circuits using flip-flops.
C104.6	Describe the basic principle of operation of communication systems and mobile phone.

Course Name: C202 (Network Theory-18EC32)

C202.1	Determine currents and voltages using source transformation/ source shifting/ mesh/ nodal analysis and reduce given network using star-delta transformation/source transformation/ source shifting
C202.2	Solve network problems by applying Superposition/ Reciprocity/ Thevenin 's/ Norton 's/ Maximum Power Transfer/ Millman 's Network Theorems and electrical laws to reduce circuit complexities and to arrive at feasible solutions.
C202.3	Calculate current and voltages for the given circuit under transient conditions. Apply Laplace transform to solve the given network.
C202.4	Solve the given network using specified two port network parameter like Z or Y or T or h
C202.5	Understand the concept of resonance
C202.6	Determine the parameters that characterize series / parallel resonant circuit.

Course Name:C203(Electronic Devices -18EC33)

C203.1	Understand the principles of semiconductor Physics
C203.2	Understand the principles and characteristics of different types of semiconductor devices
C203.3	Understand the fabrication process of semiconductor devices
C203.4	Utilize the mathematical models of semiconductor junctions and MOS transistors for circuits and systems.
C203.5	Identify the mathematical models of MOS transistors for circuits and systems.
C203.6	Analyze the circuits and develop mathematical model of MOS transistors.

Course Name: C204 (Digital System Design-18EC34)

C204.1	Explain the concept of combinational and sequential logic circuits.
C204.2	Analyze and Design the combinational logic circuits.
C204.3	Describe and characterize flip-flops and its applications.
C204.4	Design the sequential circuits using SR, JK, D, T flip-flops.
C204.5	Design the sequential circuits using Mealy & Moore machines.

C204.6	Design applications of Combinational & Sequential Circuits.

Course Name:C205 (Computer Organization and Architecture-18EC35)

C205.1	Explain the basic organization of a computer system.
C205.2	Describe the addressing modes, instruction formats and program control statements.
C205.3	Explain different ways of accessing an input / output device including interrupts.
C205.4	Illustrate the organization of different types of semiconductor and other secondary storage memories.
C205.5	Illustrate simple processor organization based on hardwired control.
C205.6	Illustrate simple processor organization based on micro programmed control.

Course Name: C206 (Power Electronics and Instrumentation-18EC36)

C206.1	Build and test circuits using power electronic devices.
C206.2	Analyze and design-controlled rectifier, DC to DC converters, DC to AC inverters and SMPS.
C206.3	Analyze the instrument characteristics and errors.
C206.4	Describe the principle of operation and Develop circuits for multirange Ammeters, Voltmeters and Bridges to measure passive component values and frequency.
C206.5	Explain the principle, design and analyze the transducers for measuring physicalParameters.
C206.6	Design bridge circuits using instrumentation transducers.

Course Name: C212 (Analog Circuits -18EC42)

C212.1	Understand the characteristics of BJTs and FETs.
C212.2	Design and analyze BJT and FET amplifier circuits.
C212.3	Design sinusoidal and non-sinusoidal oscillators.
C212.4	Understand the functioning of linear ICs.
C212.5	Design of Linear IC based circuits.
C212.6	Develop amplifier circuits using BJT and FET.

Course Name: C213 (Control Systems -18EC43)

C213.1	Develop the mathematical model of mechanical and electrical systems.
C213.2	Develop transfer function for a given control system using block diagram reduction techniques and signal flow graph method.
C213.3	Determine the time domain specification s for first and second order systems.
C213.4	Determine the stability of a system in the time domain using Routh-Hurwitz criterion.
C213.5	Determine the stability of a system in the time domain using Root-Locus technique.
C213.6	Determine the s stability of a system in the frequency domain using Nyquist and bode plots.

Course Name: C215 (Signals and Systems -18EC45)

C215.1	Analyze the different types of signals and systems.
C215.2	Determine the linearity, causality, time-invariance, and stability properties of continuous and discrete time systems.
C215.3	Evaluate the convolution sum and integral
C215.4	Represent continuous systems in time and frequency domain using different transforms
C215.5	Represent discrete systems in time and frequency domain using different transforms
C215.6	Analyze discrete Fourier time signals and systems using Z-Transforms.

Course Name: C216 (Microcontroller -18EC46)

C216.1	Explain the difference between Microprocessors & Microcontrollers, Architecture of 8051 Microcontroller, Interfacing of 8051 to external memory and Instruction set of 8051.
C216.2	Write 8051 Assembly level programs using 8051 instruction set.
C216.3	Explain the Interrupt system, operation of Timers/Counters and Serial port of 8051.
C216.4	Write 8051 Assembly language programs to generate square wave on 8051 I/O port pin using interrupt and C Programme to send & receive serial data using 8051 serial port.
C216.5	Interface simple switches, simple LEDs, ADC 0804, LCD and Stepper Motor to 8051 using 8051 I/O ports.

Course Name:C301 (Management & Entrepreneurship-17ES51)

C301.1	Understand the fundamental concepts of Management and Entrepreneurship
C301.2	Select a best Entrepreneurship model for the required domain of establishment
C301.3	Describe the functions of Managers, Entrepreneurs, and their social responsibilities
C301.4	Compare various types of Entrepreneurs
C301.5	Analyze the various roles of Entrepreneurs and Various small-scale businesses.
C301.6	Analyze the Institutional support by various state and central government agencies

Course: C302(Digital Signal Processing -17EC52)

C302.1	Determine response of LTI systems using time domain and DFT techniques.
C302.2	Compute DFT of real and complex discrete time signals.
C302.3	Computation of DFT using FFT algorithms
C302.4	Computation of DFT using linear filtering approach.
C302.5	Solve problems on digital filter design and realize using digital computations.
C302.6	Analyze the various DSP processors and its floating-point processors

Course Name: C303(Verilog HDL-17EC53)

C303.1	Write Verilog programs in gate, dataflow (RTL), behavioral and switch modeling levels of Abstraction.

C303.2	Write simple programs in VHDL in different styles.
C303.3	Design and verify the functionality of digital circuit/system using test benches.
C303.4	Identify the suitable Abstraction level for a particular digital design.
C303.5	Write the programs more effectively using Verilog tasks and directives.
C303.6	Perform timing and delay Simulation.

Course Name:C304(Information Theory & Coding -17EC54)

C304.1	Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate of Information and Order of a source
C304.2	Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms
C304.3	Model the continuous and discrete communication channels using input, output and joint probabilities
C304.4	Determine a codeword comprising of the check bits computed using Linear Block codes, cyclic codes & convolutional codes
C304.5	Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes.
C304.6	Design the encoding and decoding circuits BCH and Golay codes.

Course Name:C305 (Operating System-17EC553)

C305.1	Explain the goals, structure, operation and types of operating systems.
C305.2	Apply scheduling techniques to find performance factors.
C305.3	Explain organization of file systems and IOCS.
C305.4	Describe message passing, deadlock detection and prevention methods
C305.5	Apply suitable techniques for contiguous and non-contiguous memory allocation

Course Name: C306 (Object Oriented Programming Using C++-17EC562)

C306.1	Explain the basics of Object-Oriented Programming concepts
C306.2	Apply the object initialization and destroy concept using constructors and destructors.
C306.3	Apply the concept of polymorphism to implement compile time polymorphism in programs by using overloading methods and operators.
C306.4	Use the concept of inheritance to reduce the length of code and evaluate the usefulness
C306.5	Apply the concept of run time polymorphism by using virtual functions, overriding functions and abstract class in programs.
C306.6	Use I/O operations and file streams in programs

Course Name:C311 (Digital Communication-17EC61)

C311.1	Associate and apply the concepts of Bandpass sampling to well specified signals and channels.

C311.2	Analyze and compute performance parameters and transfer rates for low pass and bandpass symbol under ideal and corrupted non-band limited channels.
C311.3	Describe low pass and bandpass symbol under ideal and corrupted non-band limited channels.
C311.4	Test and validate symbol processing at the receiver under ideal and corrupted bandlimited channels.
C311.5	Test and validate performance parameters at the receiver under ideal and corrupted bandlimited channels.
C311.6	Demonstrate by simulation and emulation that bandpass signals subjected to corrupted and distorted symbols in a bandlimited channel, can be demodulated and estimated at receiver to meet specified performance criteria.

Course Name: C312 (ARM Microcontroller & Embedded Systems-17EC62)

C312.1	Describe the architectural features and instructions of 32-bit microcontroller ARM Cortex M3.
C312.2	Apply the knowledge gained for Programming ARM Cortex M3 for different applications.
C312.3	Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
C312.4	Develop the hardware co-design and firmware design approaches.
C312.5	Explain the need of real time operating system for embedded system applications.
C313.6	Develop the software co-design and firmware design approaches.

Course Name:C313(VLSI Design-17EC63)

C313.1	Demonstrate understanding of MOS transistor theory, CMOS fabrication flow and technology scaling.
C313.2	Draw the basic gates using the stick and layout diagrams with the knowledge of physical design aspects
C313.3	Interpret Memory elements along with timing considerations
C313.4	Demonstrate knowledge of FPGA based system design
C313.5	Interpret testing and testability issues in VLSI Design
C313.6	Analyze CMOS subsystems and architectural issues with the design constraints.

Course Name: C314 (Computer Communication Networks - 17EC64

C314.1	Identify the protocols and services of Data link layer.
C314.2	Identify the protocols and functions associated with the transport layer services.
C314.3	Describe the layering architecture of computer networks and distinguish between the OSI reference model and TCP/IP protocol suite.
C314.4	Distinguish the basic network configurations and standards associated with each network
C314.5	Analyze and design a network model using Dijkstra's algorithm.

C314.6	Construct a network model and determine the routing of packets using different routing algorithms.

Course Name:C315(Digital Switching Systems-17EC654)

C315.1	Describe the electromechanical switching systems and its comparison with the digital switching.
C315.2	Determine the telecommunication traffic and its measurements.
C315.3	Define the technologies associated with the data switching operations.
C315.4	Describe the software aspects of switching systems and its maintenance.

Course Name:C316(Digital System Design using Verilog-17EC663)

C316.1	Construct the combinational circuits, using discrete gates and programmable logic devices.
C316.2	Describe Verilog model for sequential circuits and test pattern generation.
C316.3	Design a semiconductor memory for specific chip design.
C316.4	Design embedded systems using small microcontrollers, larger CPUs/DSPs, or hard or soft processor cores. ·
C316.5	Synthesize different types of processors that are used in embedded system.
C316.6	Synthesize different types of I/O controllers that are used in embedded system

Course Name:C401(Microwave and Antennas -15EC71)

C401.1	Describe the use and advantages of microwave transmission.
C401.2	Analyze various parameters related to microwave transmission lines and waveguides
C401.3	Identify microwave devices for several applications.
C401.4	Analyze various antenna parameters necessary for building an RF system.
C401.5	Recommend various antenna configurations according to the applications
C401.6	Design/Simulate an antenna configuration according to the applications.

Course Name:C402(Digital Image Processing-15EC72)

C402.1	Understand image formation and the role human visual system plays in perception of gray and color image data.
C402.2	Apply image processing techniques in both the spatial and frequency (Fourier) domains.
C402.3	Design image analysis techniques in the form of image segmentation
C402.4	Evaluate the various Methodologies for segmentation.
C402.5	Describe Image Enhancement techniques.
C402.6	Conduct independent study and analysis of Image Enhancement techniques.

Course Name:C403(Power Electronics-15EC73)

C403.1	Describe the characteristics of different power devices and identify the various applications associated with it
C403.2	Illustrate the working of power circuit as DC-DC converter
C403.3	Illustrate the operation of inverter circuit and static switches.
C403.4	Determine the output response of a thyristor circuit with various triggering options
C403.5	Determine the response of controlled rectifier with resistive and inductive loads.
C403.6	Analyze the various types of inverters and develop SMPS.

Course Name:C404(Multimedia Communication - 15EC741)

C404.1	Understand basics of different multimedia networks and applications.
C404.2	Understand different compression techniques to compress audio and video.
C404.3	Describe multimedia Communication across Networks.
C404.4	Analyze different media types to represent them in digital form.
C404.5	Compress different types of text and images using different compression techniques and analyses DMS.

Course Name:C405(Satellite Communication - 15EC755

C405.1	Describe the satellite orbits and its trajectories with the definitions of parameters associated with it.
C405.2	Describe the electronic hardware systems associated with the satellite subsystem and earth station.
C405.3	Describe the various applications of satellite with the focus on national satellite system.
C405.4	Analyze the applications on national satellite system.
C405.5	Describe multiple access techniques.
C405.6	Compute the satellite link parameters under various propagation conditions with the illustration of multiple access techniques.

Course Name:C411(Wireless Cellular and LTE 4G Broadband -15EC81

C411.1	Understand the system architecture and the functional standard specified in LTE 4G.
C411.2	Analyze the role of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and release data and voice from users.
C411.3	Demonstrate the UTRAN and EPS handling processes from set up to release including mobility management for a variety of data call scenarios.
C411.4	Describe Resource management, packet data processing.
C411.5	Test the Performance of resource management and packet data processing and transport algorithms.

C411.6	Evaluate the Performance of resource management and packet data processing and transport algorithms.

Course Name:C412(Fiber Optics & Networks- 15EC82)

C412.1	Classification and working of optical fiber with different modes of signal propagation.
C412.2	Describe the transmission characteristics and losses in optical fiber communication.
C412.3	Describe the construction and working principle of optical connectors, multiplexers and amplifiers.
C412.4	Describe the constructional features and the characteristics of optical sources and detectors.
C412.5	Illustrate the networking aspects of optical fiber.
C412.6	Describe various standards associated with networking.

Course Name:C413(Radar Engineering- 15EC833)

C413.1	Understand the radar fundamentals and radar signals
C413.2	Explain the working principle of pulse Doppler radars, their applications and limitations
C413.3	Describe Radar applications and limitations.
C413.4	Analyze radar transmitters and receivers.
C413.5	Describe the working of various radar transmitters and receivers.
C413.6	Analyze the range parameters of pulse radar system which affect the system performance

Department of Electrical and Electronics Engineering

Vision of the Institute

To be a respected and most sought after engineering educational institution engaged in equipping individuals capable of building learning organizations in the new millennium.

Mission of the Institute

To develop competent students with good value systems and face challenges of the continuously changing world.

Vision of the Department

To meet the educational and research needs of the student community and staff through collaboration with other academic and technical institutions, industry and government agencies and make the students to face problems of the country and society.

Mission of the Department

M1 - To develop and train competent Electrical and Electronics Engineers with adequate practical skills.

M2 - To provide state-of-the-art resources that contribute to achieve excellence in teaching-learning, research, and development activities.

M3 - To inculcate, ethics, leadership, moral values, and social activities.

Program Educational Objectives

PEO 1. Be able to apply the fundamental knowledge of mathematics, science, electrical and electronics engineering to analyze and solve the complex problem in electrical, electronics and allied interdisciplinary areas.

PEO 2. Possess good leadership skills, function ethically in multidisciplinary areas to develop sustainable solutions for global, environmental, and social issues.

PEO 3. Be able to inculcate lifelong learning to maintain and enhance professional skills.

Program Specific Objectives

PSO 1: Apply fundamental knowledge to identify, formulate, design, and investigate various problems of electrical and electronic circuits, power electronics, control systems and power systems.

PSO 2: Apply modern software tools for design, simulation, and analysis of electrical systems to engage in life- long learning and to successfully adapt in multi-disciplinary environments.

PSO 3: Solve ethically and professionally various Electrical Engineering problems in societal and environmental context and communicate effectively by applying project management techniques to complex engineering problems.

Course Name:18EE32/ELECTRIC CIRCUIT ANALYSIS

C232.1	Understand the basic concepts, basic laws, reduce the complexity of the network using source transformation and source shifting, network reduction using star/delta transformations and understand the analysis of dc and ac networks
C232.2	Discuss the resonance in series and parallel circuits
C232.3	Solve complex electric circuits using superposition, Thevenin's and Norton's theorems
C232.4	Solve complex electric circuits using Reciprocity, Millman's and Maximum power transfer theorems
C232.5	Synthesize typical waveforms using Laplace transforms
C232.6	Evaluate the performance of two port networks and transient analysis

Course Name:18EE33–Transformers and Generators

C233.1	Understand the construction and operation of 1-phase, 3-Phase transformers and Autotransformer.
C233.2	Analyze the performance of transformers by polarity test, Sumner's Test, phase conversion, 3-phase connection, and parallel operation.
C233.3	Understand the construction and working of AC and DC Generators.
C233.4	Analyze the performance of the AC Generators on infinite bus and parallel operation.
C233.5	Determine the regulation of AC Generator by Slip test, EMF, MMF, and ZPF Methods.
C233.6	Performance of Synchronous Generators, Power angle characteristics.

Course Name: Analog Electronic Circuits / 18EE34

C234.1	Utilize the characteristics of transistor for different applications.
C234.2	Design and analyze biasing circuits for transistor.
C234.3	Observe the effect of negative feedback, different types of negative feedback topologies.
C234.4	Design and analyze and test transistor circuitry as amplifiers and oscillators.
C234.5	Design and working of different oscillators using BJT's.
C234.6	Develop the ability to understand the design and working of FET amplifiers.

Course Name:18EE35– Digital System Design

C235.1	Develop simplified switching equation using Karnaugh Maps
C235.2	Develop simplified switching equation using Quine McClusky techniques and Design of Adder circuits
C235.3	Design Multiplexer, Encoder, Decoder, Subtractors and Comparator as digital combinational control circuits.
C235.4	Design flip flops, counters, shift registers as sequential control circuits
C235.5	Design of Counters
C235.6	Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits and Explain the functioning of Read only and Read/Write Memories,

	Programmable ROM, EPROM and Flash memory

Course Name:18EE36 - Electrical &Electronics Measurements

C236.1	Measure resistance, inductance and capacitance using bridges and determine earth resistance.
C236.2	Construction and operation of single-phase and three phase Electrodynamometer P. Meter, Weston frequency meter and Phase sequence indicator
C236.3	Explain the working of various meters used for measurement of Power, Energy & understand the adjustments, calibration & errors in energy meters.
C236.4	Understand methods of extending the range of instruments & instrument transformers
C236.5	Explain the working of different electronic instruments
C236.6	Explain the working of different display and recording devices

Course Name:18EEL37–Electrical Machines Lab

C238.1	Evaluate the performance of transformers from the test data obtained. •
C238.2	Connect and operate two single phase transformers of different KVA rating in parallel.
C238.3	Connect single phase transformers for three phase operation and phase conversion.
C238.4	Compute the voltage regulation of synchronous generator using the test data obtained in the laboratory.
C238.5	Evaluate the performance of synchronous generators from the test data and assess the performance of synchronous generator connected to infinite bus.
C238.6	Evaluate the performance of transformers from the test data obtained. •

Course Name:18EEL38–Electrical Machines Lab

C238.1	Evaluate the performance of transformers from the test data obtained. •
C238.2	Connect and operate two single phase transformers of different KVA rating in parallel.
C238.3	Connect single phase transformers for three phase operation and phase conversion.
C238.4	Compute the voltage regulation of synchronous generator using the test data obtained in the laboratory.
C238.5	Evaluate the performance of synchronous generators from the test data and assess the performance of synchronous generator connected to infinite bus.
C238.6	Evaluate the performance of transformers from the test data obtained. •

Course Name:18EE42 – Power Generation and Economics

C242.1	Describe the working of hydroelectric, power plants and state functions of major equipment of the power plants.
C242.2	Describe the working of steam power plants and state functions of major equipment of the power plants
C242.3	Describe the working of Diesel, Gas Turbine, power plants and state functions of major equipment of the power plants

C242.4	Describe the working of nuclear power plants and state functions of major equipment of the power plants.
C242.5	Classify various substations and explain the functions of major equipment's in substations. • Explain the types of grounding and its importance.
C242.6	Infer the economic aspects of power system operation and its effects. • Explain the importance of power factor improvement.

Course Name: Transmission and Distribution / 18EE43

C243.1	Understand the concepts of various methods of generation of power.
C243.2	Parameters associated with transmission line.
C243.3	Design and analyze the overhead transmission line for different configuration.
C243.4	Calculate the parameters of transmission line for different configuration.
C243.5	Understand the use of underground cable.
C243.6	Evaluate different types of distributors.

Course Name: Electric Motors / 18EE44

C244.1	Explain the constructional features of motors and drive for specific applications.
C244.2	Analysis the performance characteristic of DC motors.
C244.3	Explain the constructional features of 3-phase and single-phase induction motors.
C244.4	Control the speed of induction motor by suitable method
C244.5	Explain the operation of synchronous motor and special motors.
C244.6	Control the speed of motor by suitable method.

Course Name: Field theory / 18EE45

C245.1	To study different coordinate systems for understanding the concept of gradient, divergence, and curl of a vector.
C245.2	To study, apply coulomb's law and gauss laws for electric field produced by different charge configuration.
C245.3	To evaluate the energy and potential due to a system of charges.
C245.4	To study the behavior of electric field across a boundary between a conductor and dielectric and between two different dielectrics.
C245.5	To study the magnetic fields and magnetic materials.
C245.6	To study the time varying fields and propagation of wave of different media.

Course Name: Opamp / 18EE46

C246.1	Explain the representation, characteristics and equivalent circuit and application.
C246.2	Designing of first, second order filters, voltage regulators using OPAMP.
C246.3	Use of OPAMP in signal generation, comparator, and converter circuits.
C246.4	Use of OPAMP in signal processing, A/D and D /A converter circuits.
C246.5	Discussion of PLL, its components and performance factors.
C246.6	Discussion of 555 timers an its application in signal generation.

Course Name: Electrical Machines Lab – 2 / 18EEL47

C247.1	Test dc machines to determine their characteristics
C247.2	Control the speed of dc motor
C247.3	Pre-determine the performance characteristics of dc machines by conducting suitable tests.
C247.4	Perform load test on single phase and three phase induction motor to assess its performance
C247.5	Conduct test on induction motor to pre-determine the performance characteristics
C247.6	Conduct test on synchronous motor to draw the performance curves.

Course Name: Opamp& LIC Laboratory / 18EEL48

C247.1	To conduct experiment to determine the characteristic parameters of OP-Amp
C247.2	To design test the OP-Amp as Amplifier, adder, subtractor, differentiator and integrator
C247.3	To design test the OP-Amp as oscillators and filters.
C247.4	Design and study of Linear ICs as multivibrator power supplies.
C247.5	Use of OPAMP in signal generation, comparator, and converter circuits.
C247.6	Use of OPAMP in signal processing, A/D and D /A converter circuits.

Course Name:17EE51 - Management & Entrepreneurship

C351.1	Explain the field of management, task of the manager, planning and the need of proper staff, recruitment, and selection process.
C351.2	Discuss work allocation, the structure of organization, the modes of communication and importance of managerial control in business.
C351.3	To explain need of coordination between the manager and staff in exercising the authority and delegating duties.
C351.4	To explain the social responsibility of business and leadershipconcepts of entrepreneurship and the role and importance.
C351.5	Show an understanding of the role and importance of Small-Scale Industries, business plan and its presentation.
C351.6	Discuss the concepts of project management, capitol building process, project feasibility study, project appraisal and project financing.

Course Name: - Microcontroller

C352.1	To explain the internal or organization and working of computers, microcontrollers and embedded processors also to compare and contrast the various members of the 8051 family.
C352.2	To explain in detail the execution of 8051 assembly language instructions and data types and to explain loop, conditional and unconditional jump and call, handling and manipulation of I / O instructions.
C352.3	To explain develop 8051C programs for time delay, I/O operations, I/O bit manipulation, logic, arithmetic operations, and data conversions.
C352.4	To explain develop 8051C serial port programming.

C352.5	To explain in detail the interfacing of various devices with 8051 C processor.
C352.6	To explain about various interrupt routines

Course Name:17EE53–Power Electronics

C353.1	- To explain application area of power electronics, types of power electronic circuits and switches their characteristics and specifications.
C353.2	To explain types of power diodes, their characteristics, and the effects of power diodes on RL circuits.
C353.3	To explain the techniques for design, operation, and analysis of single-phase diode rectifier circuits
C353.4	To explain steady state, switching characteristics and gate control requirements of different power transistors and their limitations.
C353.5	To discuss different types of Thyristors, their operation, gate characteristics and gate control requirements
C353.6	To explain designing, analysis techniques and characteristics of thyristor-controlled rectifiers.

Course Name:17EE54 – Signals and Systems

C354.1	Basics of signals and system, Classification of signals and system
C354.2	To explain in detail the basic operations on signals and properties of system
C354.3	To explain the use convolution in both continuous and discrete domain for the analysis of systems given the impulse response of a system. Provide block diagram representation of LTI system.
C354.4	To explain use Z-transform and properties of Z-transform for the analysis of discrete time systems
C354.5	To explain in detail the continuous time Fourier transform representation to study signals and linear time invariant systems
C354.6	To explain to apply Discrete time Fourier transform representation to study signals and linear time invariant systems

Course Name:17EE553 – Electrical Estimation & Costing

C355.1	Explain the purpose of estimation and costing.
C355.2	Discuss AE act and IE rules.
C355.3	Discuss energy distribution in a building, wiring, cable, fuses, lightning, points, circuits, sub circuits.
C355.4	Discuss types of service mains and estimation of service mains and power circuits.
C355.5	Discuss estimation of overhead transmission and distribution system and its components.
C355.6	Discuss main components of substation, preparation of single line diagram and ear thing of a substation.

Course Name:17EE563 – Renewable Energy Sources

C356.1	Discuss energy scarcity, solution, availability of renewable energy.

C356.2	Explain about sun, earth relationship, types of solar collectors.
C356.3	Discuss solar cell components, characteristics, application, and configuration.
C356.4	Discuss hydrogen, wind energy production, site selection, storage.
C356.5	Discuss biomass, biogas composition types, production, advantages, and disadvantages.
C356.6	Discuss availability, generation, devices for tidal, sea wave and wave and ocean thermal energy.

Course Name:17EEL57 – Microcontroller Lab

C357.1	Write Assembly language Program for arithmetic and data transfer Instructions
C357.2	Write Assembly language Program for Logical and Branching Instructions
C357.3	Write Assembly/ C language Program for Counters
C357.4	Write Assembly / C language Program for generating Delays
C357.5	Interface External control and Display devices
C357.6	To work in a team and present report

Course Name:17EEL58 – Power Electronics Lab

C358.1	To conduct experiments on semiconductor devices to obtain their static characteristics.
C358.2	To study different methods of triggering the SCR
C358.3	To study the performance of single phase controlled full wave rectifier and AC voltage controller with R and RL loads
C358.4	To control the speed of a dc motor, universal motor, and stepper motors
C358.5	To study single phase full bridge inverter connected to resistive load.
C358.6	To study protection circuit

Course Name: Control Systems / 17EE61

C361.1	Discuss the effect of feedback and types of control systems, evaluate the transfer function.
C361.2	Evaluate the stability of linear time invariant systems.
C361.3	Apply block diagram manipulation and signal flow graph.
C361.4	Demonstrate the model of control system using mathematical modeling.
C361.5	Determine the transient and steady state time response.
C361.6	Investigate the performance of the given system in time and frequency domain-based design of controller or compensator configuration.

Course Name: Power System Analysis / 17EE62

C362.1	Show understanding of per unit system, its advantages and computation.
C362.2	Perform short circuit analysis on a synchronous machine and simple power system to select a circuit breaker for the system.
C362.3	Evaluate symmetrical components of voltages and currents in un-balanced three phase circuits.
C362.4	Explain the concept of sequence impedance and sequence networks of power

	system components and power system.
C362.5	Analyse three phase synchronous machine and simple power systems for different unsymmetrical faults using symmetrical components.
C362.6	Discuss the dynamics of synchronous machine, stability, and types of stability.

Course Name: Digital Signal Processing / 17EE63

C363.1	Compute the DFT of various signals using its properties.
C363.2	Use the DFT to compute the linear and circular convolution and linear filters of long sequence.
C363.3	Apply fat and efficient algorithm for computing DFT and IDFT.
C363.4	Design of IIR Butterworth digital filters using impulse invariant/BT.
C363.5	Design of IIR digital filter using Impulse invariant/Bilinear transformation.
C363.6	Design of FIR filters using wind functions and frequency sampling method and realization of IIR and FIR filters

Course Name: Electrical Machine Design / 17EE64

C364.1	To know the properties of electrical and magnetic materials.
C364.2	To design the machines as in modern trend.
C364.3	Selection of loading for various machines
C364.4	To discuss the main dimensions of machines.
C364.5	To discuss design of AC and DC machines.
C364.6	To know the short circuit ration and performance.

Course Name: Computer Aided Electrical Drawing / 17EE651

C365.1	Discuss the terminology and types of DC and AC armature windings.
C365.2	Develop armature winding diagram for AC and DC machines.
C365.3	Develop layout of substation using standard symbols.
C365.4	Draw sectional views of transformer using design data.
C365.5	Draw sectional views of assembled DC machine or its parts.
C365.6	Draw sectional views of assembled alternator or its parts.

Course Name:17EE654 – Solar and Wind Energy

C362.1	Explain the importance of energy in human life, relationship among economy and environment with energy use and increasing role of renewable energy.
C362.2	Explain the concept of energy storage and the principles of energy storage devices.
C362.3	To discuss solar radiation on horizontal and tilted surface, its characteristics, measurement, and analysis of radiation data.
C362.4	Describe the process of harnessing solar energy and its applications in heating and cooling.
C362.5	Discuss fabrication, operation of solar cell, electrical characteristics, sizing and design of solar PVsystems and their applications.
C362.6	Explain basic Principles of Wind Energy Conversion, collection of wind data, energy estimation and site selection. Discuss the performance of Wind-machines, energy

	storage, applications of Wind Energy and environmental aspects.

Course Name: Sensors and Transducers / 17EE662

C366.1	Discuss need of transducers, classification, advantages, disadvantages, working.
C366.2	Discuss recent trends in sensor technologies of their selection.
C366.3	Discuss basics of signal codes equipment.
C366.4	Discuss configuration of DAS and data conversion.
C366.5	Show knowledge of data transmission &telemetry.
C366.6	Express measurement of non-electrical quantities.

Course Name: Control Systems Lab / 17EEL67

C367.1	Use software package or discrete components in assessing the time and frequency domain reposes of a given second order system
C367.2	Design and analyze Lead, Lag and Lag – Lead compensators for given specifications
C367.3	Determine the performance characteristics of ac and dc servomotors and synchro-transmitter receiver pair used in control systems
C367.4	Simulate the DC position and feedback control system to study the effect of P, PI, PD and PID controller and Lead compensator on the step response of the system
C367.5	Write a script files to plot root locus, bode plot, Nyquist plots to study the stability of the system using a software package
C367.6	Work with a small team to carryout experiments and prepare reports that present lab work

Course Name: Digital Signal Processing Lab / 17EEL68

C368.1	Give physical interpretation of sampling theorem in time and frequency domains.
C368.2	Evaluate the impulse response of a system
C368.3	Perform convolution of given sequences to evaluate the response of a system.
C368.4	Compute DFT and IDFT of a given sequence using the basic definition and/or fast methods
C368.5	Provide a solution for a given difference equation
C368.6	Design and implement IIR and FIR filters

Course Name:15EE71 - Power System Analysis-2

C471.1	Formulate network matrices and models for solving load flow problems
C471.2	Perform steady state power flow analysis of power systems using numerical iterative techniques
C471.3	Suggest a method to control voltage profile
C471.4	Show knowledge of optimal operation of generators on a bus bar, optimal unit commitment; discuss optimal scheduling for hydrothermal system, power system security and reliability
C471.5	Analyze short circuit faults in power system networks using bus impedance matrix
C471.6	Perform numerical solution of swing equation for multi – machine stability

Course Name:15EE72 - Power System Protection

C472.1	To discuss performance of protective relays, components of protection scheme and relay terminology and to explain relay construction and operating principles.
C472.2	To explain Overcurrent protection using electromagnetic and static relays and Overcurrent protective schemes
C472.3	To discuss types of electromagnetic and static distance relays, effect of arc resistance, power swings, line length and source impedance on performance of distance relays
C472.4	To discuss pilot protection, wire pilot relaying and carrier pilot relaying. And also, to discuss construction, operating principles and performance of various differential relays for differential protection
C472.5	To discuss protection of generators, motors, Transformer and Bus Zone Protection.
C472.6	To explain the principle of circuit interruption and different types of circuit breakers and to describe the construction and operating principle of different types of fuses and to give the definitions of different terminologies related to a fuse

Course Name:15EE73 – HIGH VOLTAGE ENGG

C473.1	Explain the Conduction and Breakdown phenomenon in gases, liquid dielectrics
C473.2	Explain the Conduction and Breakdown phenomenon in gases, solid dielectrics.
C473.3	To discuss the generation of high Voltages and currents.
C473.4	To discuss the measurement techniques for high voltages and currents.
C473.5	To discuss over voltage phenomenon and Insulation coordination in Electric power system.
C473.6	To discuss testing of materials and Electric apparatus and high voltage testing of Electric apparatus.

Course Name:15EE742 – Utilization of Electrical Energy

C4742.1	Able to discuss electric heating, air-conditioning and electric welding.
C4742.2	To explain laws of electrolysis, extraction and refining of metals and electro deposition, terminology of illumination, laws of illumination, construction and working of electric lamps.
C4742.3	Able to Design interior and exterior lighting systems- illumination levels for factory lighting- flood lighting-street lighting.
C4742.4	To discuss systems of electric traction, speed time curves and mechanics of train movement.
C4742.5	Able to Explain the motors used for electric traction and their control and discuss braking of electric motors, traction systems and power supply and other traction systems
C4742.6	Able to explain the working of electric and hybrid electric vehicles

Course Name:15EE752 – Testing and Commissioning of Power System Apparatus

C4752.1	Describe the process to plan, control and implement commissioning of electrical

	equipment's.
C4752.2	Differentiate the performance specifications of transformer and induction motor
C4752.3	Demonstrate the routine tests for synchronous machine, induction motor, transformer & switchgears.
C4752.4	Describe corrective and preventive maintenance of electrical equipment's
C4752.5	Explain the operation of an electrical equipment's such as isolators & circuit breakers
C4752.6	Explain the operation of an electrical equipment's such as induction motor and synchronous machines.

Course Name:15EEL76-Power System Simulation Lab

C476.1	Develop a program in MATLAB to assess the performance of medium and long transmission lines.
C476.2	Develop a program in MATLAB to obtain the power angle characteristics of salient and non-salient pole alternator and assess the transient stability under three phase faults at different locations in a of radial power systems.
C476.3	Develop programs in MATLAB to formulate bus admittance and bus impedance matrices of interconnected power systems.
C476.4	Use Mi-Power package to solve power flow problem for simple power systems.
C476.5	Use Mi-Power package to study unsymmetrical faults at different locations in radial power systems
C476.6	Use of Mi-Power package to study optimal generation scheduling problems for thermal power plants

Course Name: 15EEL77-High Voltage &Relay Lab

C477.1	Experimentally verify the characteristics of over current, over voltage, under voltage and negative sequence relays both electromagnetic and static type
C477.2	Experimentally verify the characteristics of microprocessor based over current, over voltage, under voltage relays and distance relay. Show knowledge of protecting
C477.3	Analyze the spark over characteristics for both uniform and non-uniform configurations using High AC and DC voltages.
C477.4	Measure high AC and DC voltages and breakdown strength of transformer oil.
C477.5	Draw electric field and measure the capacitance of different electrode configuration models.
C477.6	Show knowledge of generating standard lightning impulse voltage to determine efficiency, energy of impulse generator and 50% probability flashover voltage for air insulation.

Course Name:15EEP78-Project Work – Phase 1

C478.1	Demonstrate a sound technical knowledge of their selected project topic
C478.2	Undertake problem identification, formulation, and solution.
C478.3	Design engineering solutions to complex problems utilizing a systems approach.
C478.4	Communicate with engineers and the community at large in written an oral form.

C478.5	Demonstrate the knowledge &skills of a professional engineer.
C478.6	Demonstrate the attitudes of a professional engineer.

Course Name: Power System Operation and control / 15EE81

C481.1	Describe various levels of controls in power systems, the vulnerability of the system, components, architecture, and configuration of SCADA and Solve unit commitment problems
C481.2	Explain issues of hydrothermal scheduling and solutions to hydrothermal problems
C481.3	Explain basic generator control loops, functions of Automatic generation control, speed governors
C481.4	Develop and analyze mathematical models of Automatic Load Frequency Control
C481.5	Explain automatic generation control, voltage and reactive power control in an interconnected power system.
C481.6	Explain reliability, security, contingency analysis, state estimation and related issues of power systems.

Course Name: Industrial Drives / 15EE82

C482.1	Explain the advantages and choice of electric drive.
C482.2	Explain dynamics and different modes of operation of electric drives.
C482.3	Analyze the performance of induction motor drives under different conditions.
C482.4	Control induction motor, synchronous motor, and stepper motor drives.
C482.5	Suggest a motor for a drive and control of dc motor using controlled rectifiers
C482.6	Suggest a suitable electrical drive for specific application in the industry

Course Name: Smart Grid / 15EE831

C4831.1	Discuss the progress made by different stakeholders in the design and development of smart grid and Explain measurement techniques using Phasor Measurement Units and smart meters
C4831.2	Discuss tools for the analysis of smart grid and design, operation, and performance
C4831.3	Discuss classical optimization techniques and computational methods for smart grid design, planning and operation.
C4831.4	Explain predictive grid management and control technology for enhancing the smart grid performance
C4831.5	Discuss the computational techniques, communication, measurement, and monitoring technology tools essential to the design of the smart grid.
C4831.6	Explain methods to promote smart grid awareness and making the existing transmission system smarter by investing in new technology

Course Name: Internship / 15EE84

C484.1	Gain practical experience within industry in which the internship is done
C484.2	Apply knowledge and skills learned to classroom work
C484.3	Develop a greater understanding about career options while more clearly defining personal career goals

C484.4	Develop and refine oral and written communication skills.
C484.5	Expand intellectual capacity, credibility, judgment, intuition.
C484.6	Acquire the knowledge of administration, marketing, finance, and economics

Subject Name/ Subject Code: Project Work/ 15EEP85

C485.1	Present the project and be able to defend it
C485.2	Make links across different areas of knowledge and to generate, develop and evaluate ideas and information to apply these skills to the project task
C485.3	Habituated to critical thinking and use problem solving skills
C485.4	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms
C485.5	Work in a team to achieve common goal.
C485.6	Learn on their own, reflect on their learning and take appropriate actions to improve it

Course Name: Seminar/ 15EES86

C486.1	Attain, use, and develop knowledge in the field of electrical and electronics engineering and other disciplines through independent learning and collaborative study
C486.2	Identify, understand, and discuss current, real-time issues
C486.3	Improve oral and written communication skills
C486.4	Explore an appreciation of the self in relation to its larger diverse social and academic contexts.
C486.5	Apply principles of ethics and respect in interaction with others
C486.6	Work in a team to achieve common goal.

Department of Information Technology

Vision of the Institute

To be a respected and most sought after engineering educational institution engaged in equipping individuals capable of building learning organizations in the new millennium.

Mission of the Institute

To develop competent students with good value systems and face challenges of the continuously changing world.

Vision of the Department

To meet the educational, research & service needs of the region through collaboration with academic, technical institutions, businesses, government agencies & cultural organizations, thereby, providing a platform that encourages students & faculty to continue their intellectual & professional growth.

Mission of the Department

To develop the best Information Science Professionals, who work creatively, communicate effectively & become technologically competent and to mould them into good citizens by inculcating sense ethical values in them.

Program Educational Objectives

PEO 1. Be capable of understanding, analyzing, and applying current & emerging technologies to design and develop solutions to IT/ITES/Software/Telecom related problems and acquire value and employment.

PEO 2. To have sound foundation in mathematical, scientific and Information science engineering fundamentals necessary to formulate, solve and analyze practical problems and to prepare students for further studies and research.

PEO 3. Function effectively as individuals and team members in the workplace, growing into highly technical or project management and leadership roles, in various organizations.

PEO 4. Create an awareness of the life-long learning process, to communicate effectively, learn necessary tools to successfully identify and adapt to ever changing technologies, by ethical means and code of professional practice.

Program Specific Objectives

PSO 1. Provide effective and efficient real time solutions with the application of knowledge in IT, ITES, Networking and Software domains.

PSO 2. Demonstrate the ability to work in a team, with professional ethics, good communication and documentation skills in designing, implementation and management of software products and services, at optimal cost.

PSO 3. Proven capability to exchange views/concepts, incubate ideas and to carry out lifelong learning with zeal, to be aware of the state of art technologies and their development.

Course Name: C202 Data Structures and Applications 18CS32

C202.1	Use different types of data structures, operations,and algorithms
C202.2	Apply searching and sorting operations on files
C202.3	Use stack, Queue, Lists, Trees and Graphs in problem-solving
C202.4	Implement all data structures in a high-level language for problem-solving.

Course Name: C203 Analog and Digital Electronics 18CS33

C203.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and-amp.
C203.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
C203.3	Simplify digital circuits using Karnaugh Map, and Quine-McCluskyMethods
C203.4	Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types.
C203.5	Develop simple HDLprograms

Course Name: C234 Computer Organization 18CS34

C234.1	Explain the basic organization of a computer system.
C234.2	Demonstrate functioning of different sub systems, such as processor, Input/output, and memory.
C234.3	Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems.
C234.4	Design and analyses simple arithmetic and logical units.

Course Name:C205Software Engineering 18CS35

C205.1	Design a software system, component, or process to meet desired needs within realistic constraints.
C205.2	Assess professional and ethical responsibility
C205.3	Function on multi-disciplinary teams
C205.4	Use the techniques, skills, and modern engineering tools necessary for engineering practice
C205.5	Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems

Course Name:C206 Discrete Mathematical Structures 18CS36

C206.1	Use propositional and predicate logic in knowledge representation and truth verification.
C206.2	Demonstrate the application of discrete structures in different fields of computer science.
C206.3	Solve problems using recurrence relations and generating functions.
C206.4	Application of different mathematical proofs techniques in proving theorems in the courses.

C206.5	Compare graphs, trees, and their applications.

Course Name: C212 Design and Analysis of Algorithms 18CS42

C212.1	Describe computational solution to well-known problems like searching, sortingetc.
C212.2	Estimate the computational complexity of different algorithms.
C212.3	Devise an algorithm using appropriate design strategies for problem-solving.

Course Name: C213 Operating Systems 18CS43

C213.1	Demonstrate need for OS and different types ofOS
C213.2	Apply suitable techniques for management of different resources
C213.3	Use processor, memory, storage, and file system commands
C213.4	Realize the different concepts of OS in platform of usage through case studies

Course Name:C214 Microcontroller andEmbedded System 18CS44

C214.1	Describe the architectural features and instructions of ARM microcontroller
C214.2	Apply the knowledge gained for Programming ARM for different applications.
C214.3	Interface external devices and I/O with ARM microcontroller.
C214.4	Interpret the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
C214.5	Develop the hardware /software co-design and firmware design approaches.
C214.6	Demonstrate the need of real time operating system for embedded system applications

Course Name: C215 Object Oriented Concepts 18CS45

C215.1	Explain the object-oriented concepts and JAVA.
C215.2	Develop computer programs to solve real world problems in Java.
C215.3	Develop simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles using swings.

Course Name: C216 Data Communication 18CS46

C216.1	Explain the various components of data communication.
C216.2	Explain the fundamentals of digital communication and switching.
C216.3	Compare and contrast data link layer protocols.
C216.4	Summarize IEEE 802.xxstandards

Course Name:C301 (Management & Entrepreneurship-17CS51)

C301.1	Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance inentrepreneurship
C301.2	Utilize the resources available effectively throughERP
C301.3	Make use of IPRs and institutional support inentrepreneurship

Course Name: C302 Computer Networks

C302.1	Explain principles of application layerprotocols
C302.2	Outline transport layer services and infer UDP and TCPprotocols
C302.3	Classify routers, IP and Routing Algorithms in network layer
C302.4	Explain the Wireless and Mobile Networks covering IEEE 802.11Standard

Course Name:C303 Database Management System 18CS51

C303.1	Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship
C303.2	Utilize the resources available effectively through ERP
C303.3	Make use of IPRs and institutional support in entrepreneurship

Course Name:C304 Automata Theory and Computability17cs54

C304.1	Explain how to translate between different models of Computation (e.g., Deterministic and Non-deterministic and Softwaremodels).
C304.2	Interpret Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relativepowers.
C304.3	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision andconciseness.
C304.4	Classify a problem with respect to different models ofComputation

Course Name:C305 Object Oriented Modeling and Design17cs551

C305.1	Describe the concepts of object-oriented and basic classmodelling.
C305.2	Draw class diagrams, sequence diagrams and interaction diagrams to solve problems.
C305.3	Choose and apply a befitting design pattern for the givenproblem.

Course Name: C306 Advanced Java and J2ee17CS553

C306.1	Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficientprograms
C306.2	Build client-server applications and TCP/IP socket programs
C306.3	Illustrate database access and details for managing information using the JDBCAPI
C306.4	Describe how servlets fit into Java-based web applicationarchitecture
C306.5	Develop reusable software components using JavaBeans

Course Name:C311 Programming in Java17CS561

C311.1	Explain the object-oriented concepts andJAVA.
C311.2	Develop computer programs to solve real world problems inJava.
C311.3	Develop simple GUI interfaces for a computer program to interact withusers

Course Name:Dot Net Framework For Application Development 17CS564

C312.1	Build applications on Visual Studio .NET platform by understanding the syntax and semantics ofC#
C312.2	Demonstrate Object Oriented Programming concepts in C# programminglanguage
C312.3	Design custom interfaces for applications and leverage the available built-in interfaces in building complexapplications.
C312.4	Illustrate the use of generics and collections inC#
C312.5	Compose queries to query in-memory data and define own operatorbehavior

Course Name:C313Cryptography, Network Security And Cyber Law 17CS61

C313.1	Discuss cryptography and its need to variousapplications. Design and develop simple cryptographyalgorithms
C313.2	Understand cyber security and need cyber-Law

Course Name: C314 File Structures 17IS62

C314.1	Discuss appropriate file structure for storagerepresentation.
C314.2	Illustrate a suitable sorting technique to arrange thedata.
C314.3	lain indexing and hashing techniques for better performance to a givenproblem.

Course Name:C315 Software Testing 17IS63

C315.1	Discuss test cases for any givenproblem
C315.2	Compare the different testingtechniques
C315.3	Illustrate the problem into suitable testingmodel
C315.4	Understand the appropriate technique for the design of flowgraph.
C315.5	gn and Develop appropriate document for the softwareartefact.

Course Name:C316 Operating Systems 17CS64

C316.1	Demonstrate need for OS and different types ofOS
C316.2	Discuss suitable techniques for management of differentresources
C316.3	Illustrate processor, memory, storage, and file systemcommands
C316.4	Explain the different concepts of OS in platform of usage through casestudies

Course Name:C401 Data Mining and Data Warehousing 17CS651

C401.1	Understand data mining problems and implement the datawarehouse
C401.2	Demonstrate association rules for a given datapattern.
C401.3	cuss between classification and clusteringsolution.

Course Name: C402 System Software 17IS652

C402.1	Explain system software such as assemblers, loaders, linkersandmacroprocessors
C402.2	Design and develop lexical analyzers, parsers, and code generators

C402.3	Understand lex and yacc tools for implementing different concepts of systemsoftware

Course Name: **C403 Python Application Programming** 17CS664

C403.1	Understand Python syntax and semantics and be fluent in the use of Python flow control andfunctions.
C403.2	Demonstrate proficiency in handling Strings and FileSystems.
C403.3	Implement Python Programs using core data structures like Lists, Dictionaries and use RegularExpressions.
C403.4	Interpret the concepts of Object-Oriented Programming as used inPython.

Course Name:**C404Multi-Core Architecture and Programming** 17CS666

C404.1	Identify the issues involved in multicorearchitectures
C404.2	Explain fundamental concepts of parallel programming and its designissues
C404.3	Solve the issues related to multiprocessing and suggestsolutions
C404.4	Discuss the salient features of different multicore architectures and how they exploitparallelism
C404.5	Illustrate OpenMP and programmingconcept

Course NameWeb Technology and Its Applications /15CS71

C371.1	Adapt HTML and CSS syntax and semantics to build web pages.
C371.2	Construct and visually format tables and forms using HTML and CSS
C371.3	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically
C371.4	Appraise the principles of object-oriented development using PHP
C371.5	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features

Course NameSoftware Architecture and Design Patterns /15IS72

C372.1	Design and implement codes with higher performance and lower complexity
C372.2	Be aware of code qualities needed to keep code flexible
C372.3	Experience core design principles and be able to assess the quality of a design with respect to these principles.
C372.4	Capable of applying these principles in the design of object-oriented systems.
C372.5	Demonstrate an understanding of a range of design patterns. Be capable of comprehending a design presented using this vocabulary
C372.6	Be able to select and apply suitable patterns in specific contexts

Course NameMachine Learning / 15CS73

C373.1	Identify the problems for machine learning. And select the either supervised, unsupervised or reinforcement learning
C373.2	Explain theory of probability and statistics related to machine learning

C373.3	Investigate concept learning, ANN, Bayes classifier, k nearest neighbor, Q,

Course NameCloud Computing and Its Applications / 15CS742

C374.1	Explain cloud computing, virtualization and classify services of cloud computing
C374.2	Illustrate architecture and programming in cloud
C374.3	Describe the platforms for development of cloud applications and List the application of cloud.

Course NameStorage Area Networks / 15CS754

C375.1	Identify key challenges in managing information and analyze different storage networking technologies and virtualization
C375.2	Explain components and the implementation of NAS
C375.3	Describe CAS architecture and types of archives and forms of virtualization
C375.4	Illustrate the storage infrastructure and management activities

Department of Mathematics

Vision of the Institute

To be a respected and most sought after engineering educational institution engaged in equipping individuals capable of building learning organizations in the new millennium.

Mission of the Institute

To develop competent students with good value systems and face challenges of the continuously changing world.

Vision of the Department

We envision that our department will continue to grow as an intellectually stimulating environment that attracts engineers who have a knack for interdisciplinary research. We hope that the department will play a central role in bridging fundamental sciences and engineering.

Mission of the Department

Our mission is educating our students to excel in their work as well as mentor the next generation of engineers. We provide engineering Mathematics with theoretical and application-oriented technique and making them successful personally & professionally.

Program Educational Objectives

PEO 1.   Be able to apply the fundamental knowledge of mathematics to analyze and solve the complex problem in electrical, electronics and allied interdisciplinary areas.

PEO 2.   Possess good leadership skills, function ethically in multidisciplinary areas to develop sustainable solutions for global, environmental, and social issues.

PEO 3.   Be able to inculcate lifelong learning to maintain and enhance professional skills.

Course Name: 18MAT11 (Advanced calculus and linear algebra)

CO1	Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of the curve.
CO2	Learn the notion of partial differentiation to calculate rate of change f multivariate functions and solve problems related to composite functions and Jacobeans.
CO3	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing the area and volumes.
CO4	Solve first order linear/nonlinear differential equations analytically using standard methods.
CO5	Make use of matrix theory for solving system of linear equations and compute Eigen values and Eigen vector required for matrix diagonalization process.
CO6	Understanding and Applying the real-world problem through engineering techniques.

Course Name: 18MAT31 (Transform calculus, Fourier series and numerical techniques)

CO1	Use Laplace transform and inverse Laplace transform in solving differential/integral equation arising in network analysis, control systems and other fields of engineering.
CO2	Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field theory.
CO3	Make use of Fourier and Z- transforms to illustrate discrete/continuous function arising in wave and heat propagation, signals, and systems.
CO4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
CO5	Determine the extremals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.
CO6	Understanding the Euler's equations, Geodesics under the variational problems.

Course Name: 18MAT21 (Advanced calculus and numerical methods)

CO1	Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and exhibit the inter dependence of line, surface, and volume integrals.
CO2	Demonstrate various physical models through higher order differential equations and solve such linear ordinary differential equations.
CO3	Construct a variety of partial differential equations and solution by exact methods/ methods of separation of variables.
CO4	Explain the applications of infinite series and obtain series solution of ordinary differential equations.
CO5	Apply the knowledge of numerical methods in the modeling of various physical and engineering phenomena.
CO6	To study the behavior of LCR circuits and oscillations of springs using ODE.

Course Name: 18MAT41 (Complex analysis, probability and statistical methods

CO1	Use the concept of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
CO2	Utilize conformal transformation and complex integral arising in aero foil theory, fluid flow visualization and image processing.
CO3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
CO4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
CO5	Construct joint probability distributions and demonstrate the validity testing hypothesis.
CO6	Understanding and applying the real-world problem using through different mathematical models.

Course Name: 18CS36 (Discrete mathematical structures)

CO1	Use of propositional and predicate logic in knowledge representation and truth verification.
CO2	Demonstrate the applications of discrete structures in different fields of computer science.
CO3	Solve problems using recurrence relations and generating functions.
CO4	Apply different mathematical proofs and techniques in proving theorems in the courses.
CO5	Compare graphs trees and their applications.
CO6	Understand and analyze prefix code and design the algorithm.

MBA

Vision of the Institute

To be a respected and sought-after group of educational institutions, we are very much engaged in equipping individuals to be capable of building learning organization in the new millennium.

Mission of the Institute

Our mission is to develop competent students with good value systems to face challenges of the continuously changing world.

Vision of the Department

To impart value-based management education to the students, to nurture and enhance their competencies and to prepare them to face the challenges of industry, society, and country.

Mission of the Department

To provide integrated knowledge and demonstrated ability to the students and to groom them towards building their careers as well equipped professional. To foster a passion for learning, creative thinking, leadership skills that helps in developing entrepreneurial abilities among the students.

Program Educational Objectives

PEO1: To equip the students with necessary knowledge and managerial skills to occupy positions of management and administration in business, industry, public system, and the government.

PEO2: To inculcate appropriate ethical values and attitudes among students to function effectively in the work environment.

PEO3: To provide a right mix of managerial and business exposure to function effectively in various domains of management.

Program Specific Outcomes

PSO1. To attain sufficient theoretical knowledge in areas of General Management, Marketing, Finance, Human Resources, Economics, Statistics, and its application to solve practical problems in business.

PSO2. An ability to demonstrate interpersonal skills, problem solving skills, and leadership qualities to facilitate management graduates to adapt to changes in the environment for self-sustenance and to enable lifelong learning.

PSO3. To instill a practice of professional standards and ethics and a sense of social responsibility in every management graduate.

2019-20

Course Name:18MBA11(Management & Organizational Behavior)

C111.1	Comprehend & correlate all the management functions which are happening around with fundamental concepts and principles of management.
C111.2	Understand the overview of management, theory of management and practical applications of the same.
C111.3	Effectively use their skills for self-grooming, working in groups and to achieve organizational goals
C111.4	Demonstrate their acumen in applying managerial and behavioral concept in real world/situation.
C111.5	Understand and demonstrate their exposure on recent trends in management.

Course Name:18MBA12(Managerial Economics)

C112.1	Understand the application of Economic Principles in Management decision making
C112.2	Acquire knowledge of micro economic concepts and apply them for effective functioning of a Firm and Industry
C112.3	Ability to understand, assess and forecast Demand.
C112.4	Apply the concepts of production and cost for optimization of production.
C112.5	Design Competitive strategies like pricing, product differentiation etc. And marketing according to the market structure.
C112.6	Design Competitive strategies like pricing, product differentiation etc. And marketing according to the market structure.
C112.7	Able to identify, assess profits and apply BEP for decision making.

Course Name:18MBA13(Accounting for Managers)

C113.1	Demonstrate theoretical knowledge and its application in real time accounting.
C113.2	Demonstrate knowledge regarding accounting principles and its application.
C113.3	Capable of preparing financial statement of sole trading concerns and companies.
C113.4	Independently undertake financial statement analysis and take decisions
C113.5	Comprehend emerging trends in accounting and computerization of Accounting systems.

Course Name:18MBA14(Business Statistics& Analytics)

C114.1	Facilitate objective solutions in business decision making under subjective conditions.
C114.2	Demonstrate different statistical techniques in business/real-life situations.
C114.3	Understand the importance of probability in decision making.
C114.4	Understand the need and application of analytics
C114.5	Understand and apply various data analysis functions for business problems.

Course Name:18MBA15(Marketing Management)

C115.1	Develop an ability to assess the impact of the environment on marketing function.

C115.2	To formulate marketing strategies that incorporate psychological and sociological factors which influence buying.
C115.3	Explain how companies identify attractive market segments, differentiate and position their products for maximum competitive advantage in the marketplace.
C115.4	Build marketing strategies based on product, price, place, and promotion objectives
C115.5	Synthesize ideas into a viable marketing plan.

Course Name:18MBA16(Managerial Communication)

C116.1	Awareness of the communication skills and know their potential to become successful managers.
C116.2	To get enabled with the mechanics of writing and can compose the business letters in English precisely and effectively.
C116.3	Introduced to the managerial communication practices in business those are in vogue.
C116.4	Trained in the art of business communication with emphasis on analyzing business situations
C116.5	Exposure in drafting business proposals to meet the challenges of competitive environment.

Course Name:18MBA21(Human Resource Management)

C121.1	Understanding of HRM functions, principles, Job analysis that facilitates students to design a job description and job specification for various levels of employees.
C121.2	Synthesize knowledge on effectiveness of recruitment process, sources & understanding of systematic selection procedure
C121.3	Identify the various training methods and design a training program.
C121.4	Understand the concept of performance appraisal process in an organization.
C121.5	List out the regulations governing employee benefit practices

Course Name:18MBA22(Financial Management)

C122.1	Understand the basic financial concepts.
C122.2	Apply time value of money.
C122.3	Evaluate the investment decisions.
C112.4	Analyze the capital structure and dividend decisions.
C112.5	Estimate working capital requirements.

Course Name:18MBA23(Research Methodology)

C123.1	Understand various research approaches, techniques, and strategies in the appropriate in business.
C123.2	Apply a range of quantitative / qualitative research techniques to business and day to day management problems.
C123.3	Demonstrate knowledge and understanding of data analysis, interpretation and report writing.
C123.4	Develop necessary critical thinking skills to evaluate different research approaches in Business.

Course Name:18MBA24(Legal and Business Environment)

C124.1	Develop an understanding of the macro environment of Business and various macroeconomic concepts.
C124.2	Understand the industrial policies of the past and the present and the evolution over time, and how Indian Industrial structure evolved over time.
C124.3	Exposure to various economic policies of the country and the state of economy

Course Name:18MBA25 (Strategic Management

C125.1	Understanding the concept of Strategic Management, its relevance, Characteristics, process nature and purpose.
C125.2	Understanding of how firms successfully institutionalize a strategy and create an organizational structure for domestic and overseas operations and gain competitive advantage
C125.3	An insight on strategy at different levels of an organization to gain competitive advantage.
C125.4	Understanding the strategic drive-in multinational firms and their decisions in different markets.
C125.5	Gain knowledge of strategy implementation and the control measures for effective decision-making.

Course Name:18MBA26 (Entrepreneurship Development)

C126.1	Display keen interest and orientation towards entrepreneurship, entrepreneurial opportunities to setup a business.
C126.2	As an entrepreneur learn to think creatively and understand the components in developing a Business plan
C126.3	Become aware about various sources of funding and institutions supporting entrepreneurs.
C126.4	Gain consciousness towards social entrepreneurship and rural entrepreneurship opportunities.

Course Name:18MBAMM301(Consumer Behavior)

C231.1	Explain the background and concepts vital for understanding Consumer Behavior.
C231.2	Identify the role of variables that determines Consumer Behavior in Social & cultural domain
C231.3	Identifying the psychological and behavioral practices adopted by organizations to enhance the Consumer Behavior.

Course Name:18MBAMM302(Retail Management)

C232.1	Ability to identify the contemporary retail management, issues, and strategies.
C232.1	Evaluate the recent trends in retailing and its impact in the success of modern business.
C232.3	Relate store management and visual merchandising practices for effective retailing.

Course Name:18MBAMM303(Services Marketing)

C233.1	Develop an understanding about the various concepts and importance of Services Marketing.
C233.2	Enhance knowledge about emerging issues and trends in the service sector.
C233.3	Learn to implement service strategies to meet new challenges.

Course Name:18MBAFM301(Banking and Financial Services)

C234.1	Acquainted to various Banking and Non-Banking financial services in India
C234.2	Understand the activities of Merchant Banking and credit rating
C234.3	Equipped to understand micro financing and other financial services in India.
C234.4	Understand how to evaluate and compare leasing & hire purchase

Course Name:18MBAFM302(Investment Management)

C235.1	Understand the capital market and various Instruments for Investment
C235.2	Ability to assess the risk and return associated with investments and methods to value securities.
C235.3	Ability to analyses the Economy, Industry and Company framework for Investment Management.
C235.4	Learn the theories of Portfolio management and also the tools and techniques for efficient portfolio management.

Course Name: 18MBAFM303(Direct Taxation)

C236.1	Understand the basics of taxation and process of computing residential status
C236.2	Calculate taxable income under different heads.
C236.3	Understand deductions and calculation of tax liability of Individuals.
C236.4	Gain knowledge of the corporate tax system.

Course Name:18MBAHR301(Recruitment& Selection)

C237.1	Gain the insights of various principles and practices of recruitment and selection in an industry.
C237.2	Equip students with various selection procedure practiced in industry.
C237.3	Develop students with latest selection tools in the corporate sector.
C237.4	Develop students with various testing of job recruitment and selection

Course Name:18MBAHR302(HR Analytics)

C238.1	Understanding of How HR function adds value and demonstrates the value in business terms
C238.2	Measure the value of Intangibles that HR helps builds for the organization given a particular business context to facilitate decision making
C238.3	Convert soft factors in a people management context into measurable variables across various domains.
C238.4	Devise, conduct and analyses a study on employees or any other related to the HR

	context in an organization.

Course Name:18MBAHR303(Compensation& Reward System)

C239.1	Gain insights of various conceptual aspects of Compensation and Benefits to achieve organizational goals
C239.2	Determine the performance-based compensation system for business excellence and solve various cases
C239.3	Designing the compensation strategies for attraction, motivation and retaining high quality workforce.
C239.4	Understand the Legal & Administrative Issues in global compensation to prepare compensation plan, CTC, wage survey and calculate various bonus.

Course Name:18MBAOS307(Organization Study)

C2310.1	Exposure to the working culture of the organization
C2310.2	Application of theoretical culture to real life situation at the workplace
C2310.3	Understanding of the various functions of the organization
C2310.4	Use of McKinsey's 7S framework and Porter's five force model
C2310.5	Analysis of the financial statements

Course Name:18MBAMM401(Sales Management)

C241.1	Understand the apply the selling techniques in an organization.
C241.2	Develop a plan for organizing staffing & training sales force.
C241.3	Organize sales territories to maximize selling effectiveness.
C241.4	Evaluate sales management strategies.

Course Name:18MBAMM402(Integrated Marketing Communication)

C242.1	Define and apply knowledge of various aspects of managerial decision making related to marketing communications strategy and tactics.
C242.2	Ability to create an integrated marketing communications plan which includes promotional strategies.
C242.3	Explain the role of IMC in the overall marketing &Use effectiveness measures to evaluate IMC strategies.
C242.4	Prepare advertising copy and design other basic IMC tools.

Course Name:18MBAMM403(Digital& Social Media Marketing)

C243.1	Recognize appropriate e-marketing objectives.
C243.2	Appreciate the e-commerce framework and technology.
C243.3	Illustrate the use of search engine marketing, online advertising, and marketing strategies.
C243.4	Use social media & create templates
C243.5	Develop social media strategies to solve business problems.

Course Name:18MBAFM401(Mergers, Acquisitions & Corporate Restructuring)

C244.1	Understand Mergers & Acquisitions with its different classifications, strategies, theories, synergy etc.
C244.2	Conduct financial evaluation of M&A
C244.3	Analyze the results after evaluation
C244.4	Critically evaluate different types of M&A, takeover, and antitakeover strategies.

Course Name:18MBAFM402(Risk Management and Insurance)

C245.1	Understand various types of risks.
C245.2	Assess the process of identifying and measuring the risk.
C245.3	Acquaint with the functioning of life Insurance in risk management.
C245.4	Understand general insurance contract

Course Name:18MBAFM403(Indirect Taxation)

C246.1	Have clarity about GSTsystem in India.
C246.2	Understanding of levy and collection of GSTin India.
C246.3	Have an overview of customs duty in India.
C246.4	Understanding of valuation for customs duty.

Course Name:18MBAHR401(Public Relations)

C247.1	To demonstrate an understanding of the fundamental's tools of public relations practices.
C247.2	To describe the various emerging trends in the field of public relations.
C247.3	To analyze the importance of employee communication and organizational change
C247.4	To evaluate the importance of community relations.

Course Name:18MBAHR402(Organizational Leadership)

C248.1	Comprehend & correlate organizational leadership styles which are happening around with fundamental concepts of team leadership.
C248.2	Understand the overview of leadership behavior and motivation in organization
C248.3	Effectively use their skills for self-grooming on leadership traits and ethics that influences them to effectively work in groups to achieve organizational goals.
C248.4	Demonstrate their acumen in applying their knowledge in organizational leadership and behavioral concept in real world/situation

Course Name:18MBAHR403(International Human Resource Management)

C249.1	Analyze the impact of contemporary issues and global imperatives on Human Resource concepts, policies, and practices.
C249.2	Apply concepts and knowledge in deployment, expatriate on international assignments.
C249.3	Evaluate the effects of different human resource and international industrial relations
C249.4	Develop students to adopt international industrial relation strategies.

Course Name:18MBAPR407(Project Work)

C2410.1	To understand the working of the organization/Company/industry
C2410.2	To take up an in-depth study of an issue/problem in the area of Marketing/Finance/Human Resources
C2410.3	Ability to analyze using statistical tools and statistical packages
C2410.4	Knowledge of comprehending the data collected and editing, tabulating and presenting for analysis.

MCA

Vision of the Institute

To be a respected and sought-after group of educational institutions, we are very much engaged in equipping individuals to be capable of building learning organization in the new millennium.

Mission of the Institute

Our mission is to develop competent students with good value systems to face challenges of the continuously changing world.

Vision of the Department

With a vision to be a respected and sought-after group of educational institutions, we are very much engaged in equipping individuals to be capable of building learning organization in the new millennium.

Mission of the Department

Our mission is to develop competent students with good value systems to face challenges of the continuously changing world.

Program Educational Objectives

PEO1: Exhibit their expertise in problem Solving skills through design, analysis, Implementation and evaluation of hardware and software systems.

PEO2: Engage in the Computer Science and Applications related Profession locally and globally by contributing ethically to the competent and professional practices.

PEO3: Effectively adapt as individuals and as team members in multidisciplinary projects involving technical, managerial, economic, and social constraints.

PEO4: Demonstrate Leadership and Entrepreneurship Skills by incorporating organizational goals and providing facilities for peer members with defined objective.

Program Specific Outcomes

PSO1. The graduates of the Program will have firm foundation in understanding and applying the principles of mathematics, computing techniques and its applications.

PSO2. The graduates of the Program will have skills to develop, deploy and maintain applications for desktop, web, mobile, cloud and cross platforms using modern tools and technologies.

PSO3. The graduates of the Program will be prepared to achieve their career goals in the software industry or pursue higher studies and enhance their professional knowledge.

Course Name: Data Structures with Algorithms(20MCA11)

CO1	Demonstrate different data structures, its operations using C programming.
CO2	Analyze the performance of Stack, Queue, Lists, Trees, Hashing, Searching and Sorting techniques
CO3	Implement some applications of data structures in a high-level language such as C/C++
CO4	Design and apply appropriate data structures for solving computing problems
CO5	Compute the efficiency of algorithms in terms of asymptotic notations for the givenproblem.

Course Name: Operating System with UNIX (20MCA12)

CO1	Analyze the basic Operating System Structure and concept of Process Management
CO2	Analyze the given Synchronization/ Deadlock problem to solve and arrive at validconclusions.
CO3	Analyze OS management techniques and identify the possible modifications for the given problem context.
CO4	Demonstrate the working of basic commands of Unix environment including fileprocessing
CO5	Demonstrate the usage of different shell commands, variable and AWK filtering to the given problem

Course Name: Computer Networks(20MCA13)

CO1	Apply the basic concepts of networking and to analyze different parameters such as bandwidth, delay, throughput of the networks for the given problem
CO2	Apply different techniques to ensure the reliable and secured communication in wired and wireless communication
CO3	Analyze the networking concepts of TCP/IP for wired and wireless components
CO4	Identify the issues of Transport layer to analyze the congestion control mechanism
CO5	Design network topology with different protocols and analyse the performance usingNS2

Course Name: Mathematical Foundation for Computer Applications(20MCA14)

CO1	Apply the fundamentals of set theory and matrices for the given problem.
CO2	Apply the types of distribution, evaluate the mean and variance for the given casestudy/ problem.
CO3	Solve the given problem by applying the Mathematical logic concepts
CO4	Model the given problem by applying the concepts of graph theory.
CO5	Design strategy using gaming theory concepts for the given problem.
CO6	Identify and list the different applications of discrete mathematical concepts in computer science.

Course Name: Research Methodology and IPR(20MCA15)

CO1	Identify the suitable research methods and articulate the research steps in a proper sequence for the given problem.

CO2	Carry out literature survey, define the problem statement and suggest suitable solution for the given problem and present in the format of the research paper (IEEE).
CO3	Analyze the problem and conduct experimental design with the samplings
CO4	Perform the data collection from various sources segregate the primary and secondary data
CO5	Apply some concepts/section of Copy Right Act /Patent Act /Cyber Law/Trademark to the given case and develop –conclusions

Course Name: Data Structures with Algorithms Lab(20MCA16)

CO1	Implement sorting / searching techniques, and validate input/output for the givenproblem
CO2	Implement data structures (namely Stacks, Queues, Circular Queues, Linked Lists, and Trees), its operations and algorithms.
CO3	Implement the algorithm to find whether the given graph is connected or not and conclude on the performance of the technique implemented.
CO4	Design and apply appropriate data structures for solving computing problems
CO5	Implement the techniques for evaluating the given expression.

Course Name: Unix Programming Lab(20MCA17)

CO1	Demonstrate the working of basic commands of Unix environment including fileprocessing
CO2	Apply Regular expression to perform pattern matching using utilities like grep, sed and awk.
CO3	Implement Unix commands/ system calls to demonstrate process management
CO4	Demonstrate the usage of different shell commands, variable and AWK filtering too the given problem.
CO5	Develop shell scripts for developing the simple applications to the given problem.

Course Name: Computer Networks Lab(20MCA19)

CO1	Apply the basic concepts of networking and to analyze different parameters such as bandwidth, delay, throughput of the networks for the given problem.
CO2	Apply different techniques to ensure the reliable and secured communication in wired and wireless communication
CO3	Analyze the networking concepts of TCP/IP for wired and wireless components
CO4	Identify the issues of Transport layer to analyze the congestion control mechanism
CO5	Design network topology with different protocols and analyse the performanceusing any simulator

Course Name: Bridge Course: Basics of Programming and Computer Organisation(20MCA19-BC)

CO1	Demonstrate the key concepts introduced in C programming by writing and executing the programs.

CO2	Demonstrate the concepts of structures and pointers for the given application/ problem.
CO3	Implement the single/multi-dimensional array for the given problem.
CO4	Demonstrate the application of logic gates in solving some societal/industrial problems.
CO5	Analyse how memory organization, operations, instruction sequencing, and interrupts are useful in executing the given program.

Course Name: Database Management System(20MCA21)

CO1	Apply the basic concepts of database management in designing the database for the given problem
CO2	Design entity-relationship diagrams to the given problem to develop database application with appropriate fields and validations.
CO3	Implement a database schema for the given problem domain
CO4	Formulate and execute SQL queries to the given problem.
CO5	Apply normalization techniques to improve the database design to the given problem.

Course Name: Object Oriented Programming with Java(20MCA22)

CO1	Demonstrate the basic programming constructs of Java and OOP concepts to develop Java programs for a given scenario
CO2	Illustrate the concepts of generalization and run time polymorphism applications to develop reusable components.
CO3	Demonstrate the usage of Packages, Interfaces, Exceptions and Multithreading in building given applications.
CO4	Apply Enumerations, Wrappers, Auto boxing, Collection framework and I/O operations for effective coding to the given problem.
CO5	Implement the concepts of Applets, and networking using Java network classes for developing the distributed applications to the given problem.

Course Name: Web Technologies(20MCA23)

CO1	Apply the features jQuery for the given web-based problem.
CO2	Demonstrate the development of XHTML documents using JavaScript and CSS
CO3	Illustrate the use of CGI and Perl programs for different types of server sideapplications
CO4	Design and implement user interactive dynamic web-based applications.
CO5	Demonstrate applications of Angular JS and jQuery for the given problem

Course Name: Software Engineering(20MCA24)

CO1	Identify and define different requirements for the given problem and present in the IEEE format.
CO2	Use modern tool to create dynamic diagrams to represent the design for the givenproblem.
CO3	Draw class diagram, analyze the different types of association that exists as per the given problem and represent them using UML notations
CO4	Analyze the given system to identify actors, use cases to design use case diagrams for

	the given problem using RSA/open-source tool.
CO5	Design the static/dynamic models to meet application requirements of the givensystem and generate code (skeleton) using the modern tool.

Course Name: Cyber Security(20MCA251)

CO1	Apply IT ACT (Cyber law) to the given case/problem and infer from the given case and analyze the gap if exists.
CO2	Analyze the working of cyber security principles in designing the system.
CO3	Analyze the given problem (cybercrime, vulnerability, threat), develop a strategy(physical, logical or administrative controls) to mitigate the problem and articulateconsequences on Society and National Economy.
CO4	Examine relevant network defense / web application tool to solve given cyber securityproblem and evaluate its suitability.
CO5	Evaluate provisions available in Indian cyber law to handle infringement of intellectualproperty rights that happen on the cyber platform.

Course Name: User Interface Design(20MCA254)

CO1	Analyze the new technologies that provide interactive devices and interfaces.
CO2	Apply the guidelines to develop the UID and evaluate for the given problem.
CO3	Apply the development methodologies with an analysis of the social impact and legal issues Understand Direct Manipulation and Virtual Environment
CO4	Discuss the command, natural languages, and issues in design for maintaining QoS
CO5	Demonstrate techniques for information search and visualization for the givenproblem.

Course Name: Mobile Applications Development(20MCA263)

CO1	Develop effective user interfaces that leverage evolving mobile devices
CO2	Develop applications using software development kits (SDKs), frameworks and toolkits.
CO3	Implement suitable methods to integrate database and server-side technologies
CO4	Design and develop open-source software based mobile application to the givenproblem.
CO5	Build and deploy competent mobile application to solve the societal/industrialproblems.

Course Name: Natural Language Processing(20MCA265)

CO1	Apply parsing technique to the given problem and verify the output and give validconclusions
CO2	Illustrate the approaches to syntax and semantics in NLP.
CO3	Formulate solutions for a range of natural language components using existing algorithms, techniques and frameworks, including part-of-speech tagging, languagemodelling, parsing and semantic role labelling.
CO4	Evaluate NLP solutions of the given problem and arrive at valid conclusions
CO5	Illustrate information retrieval techniques.

Course Name: Database Management Systems Laboratory(20MCA27)

CO1	Design entity-relationship diagrams to solve given database applications
CO2	Implement a database schema for a given problem.
CO3	Formulate SQL queries in Oracle for the given problem.
CO4	Apply normalization techniques to improve the database design for the given problem.
CO5	Build database and verify for its appropriate normalization for any given problem

Course Name: Java Programming Lab(20MCA28)

CO1	Demonstrate the fundamental data types and constructs of Java Programming by writing executable/interpretable programs.
CO2	Illustrate the object-oriented principles with the help of java programs.
CO3	Develop reusable and efficient applications using inheritance and multi-threadingconcepts of java.
CO4	Apply client-side programming and networking concepts to develop distributedapplications.
CO5	Write java programs to demonstrate the concepts of interfaces, inner classes and I/Ostreams

Course Name: Web Technologies Laboratory(20MCA29)

CO1	Apply the concept and usages web-based programming techniques
CO2	Learning and Developing XHTML documents using JavaScript and CSS.
CO3	To be familiar in the use of CGI and Perl programs for different types of server side applications.
CO4	Design and implement user interactive dynamic web-based applications.

Course Name: Data Analytics using Python(20MCA31)

CO1	Demonstrate basic data analytics principles and techniques
CO2	Apply control structures to the given problems
CO3	Apply the concepts of inheritance and overloading for a given problem.
CO4	Demonstrate the concepts of learning and decision trees for a given problem.
CO5	Demonstrate the concepts of neural networks and genetic algorithms for a given problem

Course Name: Internet of Things(20MCA32)

CO1	Analyze the IoT architecture and design along with functional/compute stack and data management.
CO2	Apply IOT architecture for a given problem
CO3	Analyze the application protocol, transport layer methods for the given businesscase.

CO4	Analyze the application of data analytics for IOT for a given
CO5	Analyse the architecture and develop programming using modern tools for the given use case

Course Name: Advances in Java(20MCA33)

CO1	Apply the concept of Servlet and its life cycle to create web application
CO2	Apply JSP tags and its services to web application.
CO3	Create packages and interfaces in the web application context.
CO4	Build Database connection for the web applications.
CO5	Develop enterprise applications using Java Beans concepts for the given problem.

Course Name: Cloud Computing(20MCA342)

CO1	Demonstrate the system & software models and mechanisms that support cloudcomputing
CO2	Classify various cloud services and their providers
CO3	Compare various cloud deployment models
CO4	Differentiate various types of computing environments
CO5	Identify enabling technologies of cloud computing.

Course Name: Software Testing20MCA344)

CO1	Acquire knowledge of basic principles and knowledge of software testing and debugging and test cases.
CO2	Will be able to understand the perceptions on testing like levels of testing, generalizedpseudo code and with related examples.
CO3	To study the various types of testing.
CO4	Differentiate between functional testing and structural testing.
CO5	Analyse the performance of fault-based testing, planning and Monitoring the process, Documentation testing.

Course Name: Deep Learning(20MCA351)

CO1	Demonstrate the basics of deep learning for a given context.
CO2	Implement various deep learning models for the given problem
CO3	Realign high dimensional data using reduction techniques for the given problem
CO4	Analyze optimization and generalization techniques of deep learning for the givenproblem.
CO5	Evaluate the given deep learning application and enhance by applying latest techniques.

Course Name: Big data Analytics(20MCA352)

CO1	Identify the business problem for a given context and frame the objectives to solve itthrough data analytics tools
CO2	Apply various algorithms for handling large volumes of data.

CO3	Illustrate the architecture of HDFS and explain functioning of HDFS clusters.
CO4	Analyze the usage of Map-Reduce techniques for solving big data problems.
CO5	Conduct experiment with various datasets for analysis / visualization and arrive at validconclusions.

Course Name: Data Analytics Lab(20MCA36)

CO1	Develop python program to perform search/sort on a given data set
CO2	Demonstrate object-oriented principles
CO3	Demonstrate data visualization using NumPy for a given problem
CO4	Demonstrate regression model for a given problem
CO5	Design and develop an application for the given problem

Course Name: Mini project with IOT Lab(20MCA37)

CO1	Demonstrate the IoT architecture design for a given problem
CO2	Apply IOT techniques for a given problem
CO3	Analyze the application protocol, transport layer methods for the given business case.
CO4	Design and develop an application for the given problem for the societal/industrial problems
CO5	Develop python program by applying suitable feature for the given problem and verify the output

Course Name: Advances in Java Lab(20MCA38)

CO1	Apply the concept of Servlet and its life cycle to create web application.
CO2	Apply JSP tags and its services to web application
CO3	Create packages and interfaces in the web application context.
CO4	Build Database connection for the web applications.
CO5	Develop application programs using beans concept.

Course Name: Advances in Web Technologies(20MCA41)

CO1	Build the Web Applications using jQuery, PHP, XML for the given problem
CO2	Design the Web Pages using AJAX for the given problem
CO3	Analyze the advances in Web2.0 and demonstrate its usage for the problem considered
CO4	Analyze the web services and demonstrate its usage for the problem considered.
CO5	Design responsive web applications using Bootstrap for the given problem.

Course Name: Programming using C#(20MCA42)

CO1	Analyze C#andclient-serverconceptsusing. Net Framework Components.
CO2	Apply delegates, eventandexceptionhandlingtoincorporatewithASP, WinForms, ADO.NET
CO3	Analyzetheuseof.NetComponentsdependingontheproblemstatement.
CO4	Implement&developawebbasedandConsolebasedapplicationwithDatabase connectivity

CO5	Implement & develop a web-based application with Database connectivity

Course Name: Industry Internship(20MCA43)

CO1	Analyze the real-time industry/research work environment with emphasis on organizational structure/job process/different departments and functions / tools/technology.
CO2	Develop applications using modern tools and technologies
CO3	Demonstrate self-learning capabilities with an effective report and detailedpresentation.

Course Name: Project Work(20MCA44)

CO1	Identify a suitable problem making use of the technical and engineering knowledge gained from previous courses with the awareness of impact of technology on the society and their ethical responsibilities.
CO2	Work as an individual and team to segregate work and execute/implement projects using appropriate tools.
CO3	Develop skills to disseminate technical and general information by means of oralas well as written presentation and professional skills
CO4	To conduct testing of application using appropriate techniques and tools.
CO5	To enhance interpersonal skills and group cohesion among the peers during the project work

Department of Mechanical Engineering

Vision of the Institute

To be a respected and most sought after engineering educational institution engaged in equipping individuals capable of building learning organizations in the new millennium.

Mission of the Institute

To develop competent students with good value systems and face challenges of the continuously changing world.

Vision of the Department

To become a center of excellence providing state of the art engineering education in mechanical engineering and making individual to be capable of building nation in the new millennium.

Mission of the Department

Mission 1:   To provide an excellent teaching and learning process for the students to meet the needs and standards of the current industries and higher learning process.

Mission 2:   To promote research and development activity in the recent emerging trends of the mechanical engineering department.

Mission 3: To provide the students with good communication skill, lifelong learning, team spirit and leadership qualities to face the current society.

Program Educational Objectives

PEO 1: Graduates in Mechanical Engineering will apply the basic technical knowledge for design, product development and analysis of mechanical engineering systems.
PEO 2: Graduates in Mechanical Engineering will demonstrate skill for research, innovation, higher studies, and entrepreneurship.
PEO 3: Graduates in Mechanical Engineering will demonstrate good communication skills, dynamic leadership qualities and awareness about environmental protection. blended with ethics and human values.

Program Specific Outcomes

PSO1	Apply Mechanical Engineering knowledge to address wide range of technical and societal problems with lifelong learning and professional development creativity, imagination, confidence, and responsibility.
PSO2	To understand the concept of manufacturing and design analysis of Mechanical components in various industrial sectors and development of the products in mechanical engineering
PSO3	Analyzing, evaluating thermal aspects for design and development of engineering products like I.C Engines, Refrigeration, Air-conditioning, Conventional and Non-Conventional Power Generating Systems.

Course Name: Elements of Mechanical Engineering-18EME14/24

C104.1	Understand the concept of nonrenewable and renewable energy and the working principles of different types of boilers and accessories.
C104.2	Learn the basic principles of operations of steam, water and gas turbines, IC Engines
C104.3	Understand the concept of refrigeration and air conditioning systems
C104.4	Gains knowledge on material joining processes, understands the concept of lubrication and different types of bearings.
C104.5	Get exposure to machining operations on lathe,milling,drilling, and grinding machines
C104.6	Understands the principle of power transmissions through belt drives and gear trains

Course Name: Workshop Practice-18WSL16/26

C108.1	Identify the fitting tools and instruments.
C108.2	Apply knowledge of fitting tools and measuring instruments for getting an object of required shape and size
C108.3	Acquire the skill required for carrying out the welding using electric arc welding process.
C108.4	Applying the skill acquired for preparing the different welding joints.
C108.5	Demonstrate the sheet metal working and joining by soldering processes.
C108.6	Understand the working of various power tools and its applications in mechanical engineering.

Course Name: Computer Aided Engineering Drawing-18CED14

C112.1	Understand the importance of engineering drawing as language of engineers.
C112.2	Able to draw the front, top and side views of points and straight lines.
C112.3	Able to draw the orthographic projections of regular plane surfaces in different orientations.
C112.4	Develops skill to imagine and draw the projections of regular solids.
C112.5	Understand the concept of the development of lateral surfaces of regular solids.
C112.6	Develop skill to generate 3D views like isometric projection of different types of solids and combination solids.

Course Name: Material Science & Metallurgy-10ME32A

C202.1	An understanding of the basic concepts of heat treatment process and its influences on properties of metal.
C202.2	An understanding of types of structures, imperfections in metals, diffusion mechanism, evaluation of mechanical properties by subjecting to various stresses and failure mechanism.
C202.3	An understanding of the basic concepts of phase transformation during solidification, phase diagrams, iron carbon equilibrium diagram, classifications of steel, iron, AL, CU, and it's alloys.

C202.4	An understanding of the basic concepts of classification, fabrication, and applications of composite materials.
C202.5	To understand the various processes for manufacturing of composites and obtain a knowledge of contemporary issues and an ability to use the skills and techniques in engineering practice
C202.6	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice and lifelong learning.

Course Name: Basic Thermodynamics-18ME33

C203.1	Understand the fundamentals of thermodynamics.
C203.2	Demonstrate the work and heat transfer in thermodynamic systems.
C203.3	Formulate the heat, work, and energy of the system for various thermodynamic processes.
C203.4	Evaluate the performance of heat engines, heat pumps and refrigerators.
C203.5	Analyze the entropy change for various thermodynamic processes and thermodynamic properties of pure substances.
C203.6	Impart the knowledge in thermodynamic relations and distinguish between ideal and real gases.

Course Name: Mechanics of Materials-18ME34

C204.1	Learn basic concepts of simple stress and strain.
C204.2	Understand importance of stresses in composite sections, principal stresses and strains.
C204.3	Analyze the stresses in thick and thin cylinders.
C204.4	Draw shears force and bending moments.
C204.5	Gain knowledge on bending and shear stresses, deflection of beams.
C204.6	Impart knowledge of torsion of circular shafts and stability of columns.

Course Name: Manufacturing Process-I-18ME35

C205.1	Understand basic concept of foundry technology and identify various types of patterns, binders, additives, core, molding machines.
C205.2	Analyze working principle of gating and reserving systems, special molding processes
C205.3	Describe different furnaces used for melting of metals and special types of casting process.
C205.4	Demonstrate different methods of welding in the application of fabrication works and joining of two metals/alloys.
C205.5	Apply the concept of special types of welding, brazing, and soldering.
C205.6	Enhance the knowledge of metallurgical aspect in welding.

Course Name: Computer Aided Machine Drawing-18ME36A

C206.1	Student will be able to sketch sections of solids of various polyhedrons and visualize and draw orthographic views of simple machine parts.

C206.2	Student can understand and draw various thread forms, standard keys,
C206.3	Understanding of various types riveted joints and their drawings, couplings using memorable drawing
C206.4	The students can visualize and prepare detailed drawing of a given part and draw
C206.5	CO-5 Read and interpret a given drawing and Create 2-D and 3-D models using solid edge software with manufacturing purposes.
C206.6	Producing detailed sectional views drawing of a 3-D models using solid edge Software with parts list.

Course Name: Metallography & Material Testing Lab-18MEL37A

C207.1	e Students will be able to demonstrate the knowledge and the skills required for the conduction of Tensile, Shear and Compression test.
C207.2	The students will be able to determine the torsional and bending strength of different materials.
C207.3	e students will learn Identification of metals based on Microstructures.
C207.4	e students will be capable of detecting the defects like cracks, flaws in materials by using different NDT methods.
C207.5	e students will know the material behavior for impact and wear loads.
C207.6	e students will be capable of determining hardness of metals using different methods.

Course Name: Foundry & Forging Lab-18MEL38A

C208.1	Demonstrate various skills of sand preparation, molding.
C208.2	Conduct tests on foundry sands to determine properties for different ingredient compositions.
C208.3	Apply knowledge of design and practices of mold and pattern making.
C208.4	Analyze the design of gating system.
C208.5	Demonstrate various skills of forging operations.
C208.6	Work as a team keeping up ethical principles.

Course Name: Mechanical Measurements & Metrology-18ME42B

C210.1	Students shall demonstrate the knowledge associated with Comparators (Mech, Optical, and Electrical& Pneumatic), Use of Sine bar, Interferometer, and measurement of Screw threads & Gear tooth parameters.
C210.2	Students shall demonstrate the knowledge associated with Generalized Measurement system, Transducers, CRO, Oscillographs, and XY Plotters.
C210.3	Students shall demonstrate the knowledge associated with Measurement of Force, Torque, and Temperature& Strain measurement.
C210.4	Students shall demonstrate the knowledge associated with various Standards of length, use of slip gauges, and System of limits, fits and tolerance and Design of Gauges.
C210.5	Students will be able to work in Quality control and quality assurances divisions in

	industries.
C210.6	Students will be able to design a sensors and transducers used for stress analysis, design a measuring equipment's for the measurement of temperature and flow, to maintain quality in engineering products.

Course Name: Applied Thermodynamics-18ME43

C211.1	Describe the application; apply the concepts of combustion thermodynamics in engineering field.
C211.2	Analyze and implement various aspects of air standard cycles and basic concepts of gas power cycles.
C211.3	Evaluate the performance of various working aspects of internal combustion engines
C211.4	Understand the different concepts and implement various vapor power cycles, Analyze the concepts and functioning of reciprocating compressors.
C211.5	Apply knowledge of working procedure of gas turbine and Jet and Rocket Propulsion system.
C211.6	Describe the various psychometric processes; understand the working of air conditioning systems and refrigeration systems.

Course Name: Kinematics of Machines-18ME44

C212.1	To identify and select the proper mechanisms for the application in real life situations.
C212.2	Calculate mobility for various mechanisms and enumerate rigid links and types of joints within mechanisms.
C212.3	Explain different mechanisms and conduct a velocity and acceleration analysis of the different mechanisms.
C212.4	Construct CAM profile for the specific follower motion.
C212.5	To identify different gear trains for various practical applications and solve simple problems.
C212.6	To classify gears and calculate the various spur gear dimensions.

Course Name: Manufacturing Process-II18ME45

C213.1	Understand metal cutting principles, cutting tool materials, properties,and fluid selection.
C213.2	Classify and understand the principle and constructional features, operations performed on Lathe & drilling machine.
C213.3	Understand and to operate the Milling machine and to know the concept of indexing mechanism and its methods.
C213.4	Understand the concept of Grinding machines and its constructional features. And, to know the selection of grinding wheel.
C213.5	Understand the principles, applications, and features of super finishing, polishing and buffing operations, honing etc.
C213.6	Select the types of non-traditional machines and methods of operations along with applications.

Course Name: Fluid Mechanics18ME46B

C214.1	To impart basic knowledge of fluid, its properties and recognize the various types of fluid flow, also variation of Pressure in a fluid is at rest.
C214.2	To made them understand the concept of Euler's equation and extracting Bernoulli's equation also to understand and analyze the Head losses in laminar and turbulent flow through pipes.
C214.3	To Contend the importance of flow measurement and use of dimensional analysis to design physical or numerical experiments and to apply dynamic similarity.
C214.4	Can understand the reasons for Major and minor loss of energy through pipe
C214.5	To understand and analyze the Head losses in laminar and turbulent flow through pipes.
C214.6	To learn the concept of Buoyancy and importance of continuity equation and can implement the compressible flow and flow around immersed bodies.

Course Name: Mech. Measurements & Metrology Lab18MEL47B

C215.1	Understand the basic measurement units and calibrate various measuring devices.
C215.2	Use various measuring tools such as Sine Bar, Sine Center, Bevel Protractor to find taper and included angles.
C215.3	Gain knowledge on Optical Microscope, Tool Maker Microscope to measure screw thread parameters.
C215.4	Learn basic concepts of measuring temperature, pressure and strain using different methods.
C215.5	Gain knowledge on various measuring equipment's applied to engineering analysis in industries.
C215.6	Impart knowledge of error and correction factors of various measuring devices.

Course Name: Machine Shop18MEL48B

C216.1	Describe the knowledge and the skills required with respect to the operation, procedure, conduction and analyzing the results of experiments.
C216.2	Perform the operations in lathe machine.
C216.3	Analyze the operations in milling machine and its mechanism.
C216.4	To know the concepts of grooving operations using Shaping machine.
C216.5	Demonstrate of operations on drilling machine.
C216.6	Impart the knowledge of Eccentric turning using four jaw chuck

Course Name: Management and Entrepreneurship17AL51

C301.1	Understand the basic concepts of management and development of effective planning process.
C301.2	Understand the principles of organization and Illustrate different organizational structures.
C301.3	Understand the staff selection process, recruitment process and project selection process as well as directing, motivating, and controlling.

C301.4	To know how to motivate, directing and controlling the managers and management.
C301.5	Develop entrepreneurship and its concepts pertaining to small scale industries for sustainable development.
C301.6	Understand different schemes of government support to small scale industries and preparation of project report.

Course Name: Design of Machine Elements-I17ME52

C302.1	Apply the concept of mechanics of materials to estimate the stresses in a machine element & predict failure of components.
C302.2	Analyze failure of components using different theories of failure for static loadings
C302.3	Determine the stress concentration factor for different irregularities and strength of components under different impact loadings.
C302.4	Design the machine components for fatigue failure & also for threaded fasteners.
C302.5	Design of keys, Shafts, cotter & knuckle joint & couplings used for power transmission
C302.6	Design & Analyze the power screws and welded joints for different applications.

Course Name: Energy Engineering17ME53

C303.1	Describe the working principle of steam power plant and ability to solve problems involving height of chimney to produce a given draft.
C303.2	Apply knowledge of super heater, De-super heater, control of super heaters, economizer
C303.3	Evaluate the various methods of starting diesel engines and need for lubrication.
C303.4	Import the knowledge of Hydrograph, how to draw the hydrograph, flow duration and mass curve and its applications.
C303.5	Apply the knowledge of nuclear energy, solar energy and wind energy.
C303.6	Demonstrate the various energy conversion methods such as Tidal power energy, Ocean thermal energy conversion, geothermal energy and photosynthesis.

Course Name: Dynamics of Machines17ME54

C304.1	Students will be able to do static and dynamic analysis of different mechanisms subjected to forces using various principles.
C304.2	Students will be able to analyze the concept of friction in different bearings and belt drive.
C304.3	Students will be able to solve the problems on balancing of rotating masses in same and different planes.
C304.4	Analyze the concept of primary & secondary forces of reciprocating masses in different engines.
C304.5	Students will be able to determine thevarious parameters of governors and its usage.
C304.6	Course content helps the students to analyze gyroscopic effect on different vehicles andAnalysis of Cams.

Course Name: Manufacturing Process-III17ME55

C305.1	Students will be able to understand necessity of forming process compared with other manufacturing techniques, and the knowledge of parameters effect on the processing of the wrought products.
C305.2	Students will be able to determine the process, load required and possible reasons for the formation of defects in forged components.
C305.3	Students will be able to identify the process, load calculations and reasons for defective rolled products.
C305.4	Students will be able to apply the knowledge of drawing and extrusion to find out defects and problems occurred in the processes.
C305.5	Students will be able to select the different process, related equipment's, and parameters for the fabrication of various sheet metal components.
C305.6	Students will be able to select the different high energy rate forming process and powder metallurgy for the fabrication of bulk components.

Course Name: Turbo Machines   17ME56

C306.1	Understanding the comparison of positive displacement machine and turbo machine.
C306.2	Gain the knowledge of working of centrifugal pumps.
C306.3	Study the performance of various hydraulic turbines.
C306.4	Impart the knowledge of performance of steam turbines.
C306.5	Sound knowledge of energy transfer in turbomachinery.
C306.6	Sound knowledge about stage efficiency, reheat factor and preheat factors in turbines and pumps, compression and expansion processes, the working of centrifugal and axial compressors.

Course Name: Fluid Mechanics & Machines Lab17MEL57

C307.1	Students will be able to analyze fluid flow principles.
C307.2	Gain the knowledge in analyzing the performance of turbines and pumps.
C307.3	Able to determine coefficient of friction, minor losses in flow through the pipes.
C307.4	Students will be able to calibrate flow measuring devices such as orifice meter, venture meter and V- Notch and performance of centrifugal pumps.
C307.5	Students will have the ability to test the performance of turbines like Pelton wheel, Francis turbine and Kaplan turbine.
C307.6	Students will have the ability to test the performance of two stages reciprocating air compressor and air blower.

Course Name: Energy Conversion Lab17MEL58

C308.1	At the end of the course, students will be able to determine the Flash point, Fire point, calorific value, and viscosity of various lubrication oils.
C308.2	Students will have the knowledge of engine operation through valve timing diagram.
C308.3	To conduct performance test on Two stroke Petrol Engine.
C308.4	To conduct performance test on 4 stroke Diesel Engine, Four Stroke Petrol Engines.

C308.5	Students able to draw valve timing and port timing diagram.
C308.6	Impart the knowledge of application of planimeter.

Course Name: Computer Integrated Manufacturing17ME61

C309.1	Understand basic concepts of computer integrated Manufacturing, utilization parameters of machine and their capabilities
C309.2	Apply different work transfer methods and mechanism for high volume production
C309.3	Designautomated assembly systems for high volume production and analyzes single station, MultiTaction and automated guided vehicle system.
C309.4	Developmentof various types of computer aided manufacturing and planning systems
C309.5	Enhance various terminology, programming methods of robot and write part program in Robotics & CNC machine.
C309.6	Analyzeflow lines and solve problems through line balancing methods for manufacturing

Course Name: Design of Machine Elements-II17ME62

C310.1	Demonstrate the fundamentals of stress analysis, different stress in curved beams and Design and select power transmission elements.
C310.2	Make proper assumptions with respect to material, size, static and dynamic loads for springs, clutches, and brakes.
C310.3	To change the existing design with minimum effort for better result/performance of IC-Engine parts
C310.4	Design of spur and helical gears for different power transmission ratio and to find BHN.
C310.5	Design bevel and worm gears based on strength, dynamic and wear loads.
C310.6	Performance of the rotating components can be increased with better knowledge of lubrication

Course Name: Heat & Mass Transfer17ME63

C311.1	Provide sound understanding of the basic principles and laws, modes of heat transfer, different types of Fins and fin efficiency.
C311.2	Capability to analyze transient mode of heat transfer and use of Heiselers Charts.
C311.3	To know various heat transfer processes and heat exchangers.
C311.4	Able to analyze different regimes of boiling and condensation.
C311.5	To impart the knowledge of natural and forced convection and non-dimensional numbers associated with it.
C311.6	Understand the concept of radiation heat transfer.

Course Name: Finite Element Methods17ME64

C312.1	Learn basic principles of finite element method for analysis of structures.
C312.2	Understand importance of principle of minimum potential energy, Raleigh's Ritz and Galperin's method to solve engineering problems.

C312.3	Analyze the finite element formulation of 2-D elements and higher order elements.
C312.4	Get exposure the finite element analysis of bars in engineering field.
C312.5	Gain knowledge on the finite element analysis of trusses.
C312.6	Impart knowledge of finite element analysis of beams and heat transfer problems.

Course Name: Mechatronics & Microprocessor17ME65

C313.1	Learn basic concepts of Mechatronics systems.
C313.2	Understand importance of Transducers and Sensors.
C313.3	Gain knowledge on electrical actuation system and signal conditioning.
C313.4	Learn basic concepts of Microprocessor and number system, logic gates.
C313.5	Gain knowledge on logic function of INTEL 8085A Microprocessor.
C313.6	Impart knowledge of CPU, organization, and programming of Microprocessor.

Course Name: TOE17ME66X

C314.1	Develop equations of equilibrium, Mohr's diagram & characteristic equation of principal stress for 2D & 3D stress systems
C314.2	Able to identify the possible strain field using compatibility equations. Reducing the complexity by assuming plane stress & plane strain condition.
C314.3	Derive the solutions for a two-dimensional problem in Cartesian coordinates using Airy's stress function method and to develop equations of equilibrium for 2D stress system in Polar co-ordinate system.
C314.4	Identify the stress distribution of different parts such as rotating disks & rotating cylinders. To derive equations for torsion of thin open sections & tubes.
C314.5	Derive equation for Radial & Circumferential stresses for disk, cylinders & sphere subjected to thermal loading.
C314.6	Understand the importance of basic theorems to solve practical problems.

Course Name: NTM17ME665

C314.1	To appreciate the importance of NTM methods and their advantages over conventional methods.
C314.2	To demonstrate the working of USM processes.
C314.3	To operate with the elements of AJM & WJM processes.
C314.4	To gain the knowledge of elements related to ECM & Chemical machining processes.
C314.5	To select an appropriate NTM process for the machining of the components and suitable electrodes of EDM.
C314.6	To correlate specific applications of PAM, LBM and EBM process.

Course Name: Heat & Mass Transfer Lab17MEL67

C315.1	Understand the concept and mechanism of forced, natural convection taking place in objects of different geometries, the various empirical correlations used in different fluid flow situations.
C315.2	Learn the thermal performance analysis of heat exchangers, their practical applications.
C315.3	At the end of the course, students will be able to understand conduction phenomenon thoroughly in objects of different geometries they can determine the thermal conductivity of composite wall, lagging material and critical heat flux.
C315.4	Understand the performance analysis of vapor compression refrigeration cycle and air conditioning system.
C315.5	Understand the concept of radiation heat transfer.
C315.6	To impart the knowledge non-dimensional numbers associated with natural and forced convection.

Course Name: CAMA Lab17MEL68

C316.1	le to define the different element types, properties and material models to the different structures being analyzed.
C316.2	idents can be able to do the stress analysis of bar, truss, beam and simple mechanical structures and validate the results with theoretical results.
C316.3	idents will carry out static and dynamic analysis of simple beams and bars.
C316.4	idents will be able to analyze the thermal problems like conduction and convection using ANSYS.
C316.5	idents will be able to do Air flow analysis of pipe and flat plate.
C316.6	Student will be able to solve thermal and mechanical stress problems.

Course Name: Engineering Economics 15ME71

C401.1	Students will be able to understand types of interest and its factors and use them in EMI and loan calculations.
C401.2	Students will be able to characterize different assets based on their Present, equivalent, and future worth and judge the best alternative.
C401.3	Students will be able to appreciate depreciation, costing, and estimation procedure.Perform tax analysis.
C401.4	Students will be able to Analyze the financial concepts and prepare financial statements for the company.
C401.5	Students will be able to use the knowledge of financial ratios for determining the firm's earning power.
C401.6	Students will be able to demonstrate the concepts of financial and profit planning through suitable budgeting.

Course Name: Mechanical Vibrations 15ME72

C402.1	Understand basic concepts of vibrations & learns to use the Fourier series method to idealize any motion in terms of sine & cosine curves which can be used in vibration analysis
C402.2	Able to write a mathematical model of undamped systems and can deploy the proper method to obtain the natural frequency of the system, which is required in failure analysis.
C402.3	Gains insight into the damped, forced vibrations and develops the skill to utilize the over, under and critically damped systems in different applications
C402.4	Realize the importance of vibration measuring, condition monitoring and methods to avoid vibrations.
C402.5	Learn to idealize any physical system into two DOF systems and determine their natural frequencies & mode shapes
C402.6	Able to solve multi DOF system and obtain their natural frequencies by numerical methods which helps the engineer to design stable system

Course Name: Hydraulics and Pneumatics 15ME73

C403.1	Describe the working principles of hydraulic and pneumatic system and its applications.
C403.2	Apply knowledge of pumps, motors and its application.
C403.3	Evaluate the various types of valves and its applications.
C403.4	Import the knowledge of circuit design, control valves and its applications
C403.5	Learn and apply multi-purpose cylinder applications
C403.6	Describe the working principles of hydraulic and pneumatic system and its applications.

Course Name: Operation Research-15ME74

C404.1	Ability to understand and analyze solution for linear programming problems in industry so that they can use resources (capitals, men, machine and materials) more effectively.
C404.2	Students will have the knowledge of optimizing the transportation models, assignment and travelling salesman problems. **Solve** the problem of transporting the products from origins to destinations with least transportation cost.
C404.3	Students will have the analysis of optimizing the Integer Programming models and Queuing theory.
C404.4	Students will have the Understand of Project management techniques: PERT-CPM & crashing techniques to reduce the man, machine, and material to increase the profits and reduce the losses.
C404.5	Students will have the knowledge of Game Theory analytical and graphical method problems solving for different types of Job's.
C404.6	Students will have the Describe the Sequencing of different types of Job's to reduce man, machine and material cost to increase the profit.

Course Name: Non-Conventional Energy Sources 15ME754

C405.1	Understand the present energy scenario and the available non-conventional energy sources.
C405.2	Describe the basics of solar radiation geometry and various measurement techniques.
C405.3	Analyze the knowledge gained in tapping the solar energy through solar thermal devices, PV conversion and their performance analysis.
C405.4	Demonstrate the various energy conversion methods such as Wind, Tidal, OTEC and Geothermal.
C405.5	Apply knowledge of Biomass and Hydrogen energy and their impact on environment and sustainability.
C405.6	Understand the present energy scenario and the available Non-conventional energy sources.

Course Name: Theory of Plasticity 15ME752

C405.1	Get exposed to concepts of theory of elasticity, importance of stress and strains which are needed to understand the theory of plasticity.
C405.2	They knew about types of strain and plastic deformation of ductile materials.
C405.3	Use different yield criteria and its importance.
C405.4	Realize the importance of experimental verification of stress- strain relationship and bending of beams and use it in design of mechanical components.
C405.5	They can analyze stress; shear and residual stresses are distributed on the different types of beam.
C405.6	Gain knowledge on torsion of circular &non-circular shafts.

Course Name: Experimental Stress Analysis 15ME761

C406.1	ility to brief about types, mounting and performance of strain gages and wheat stone bridge circuits.
C406.2	dents can be aware of about different configurations of strain rosettes and its error minimization.
C406.3	dents can brief about concepts of Photoelasticity, polar scope and calibration of different models.
C406.4	get exposure on Two- and Three-Dimensionalphotoelasticity models and techniques
C406.5	ey will understand about Birefringent and Brittle coating methods used in ESA.
C406.6	They can use moiré techniques for finding stresses and displacements.

Course Name: Design Lab 15MEL77

C407.1	Understand the concept of natural frequency and damping coefficient in a single DOF vibrating system.
C407.2	To analyze the balancing of rotating masses by using static and dynamic balance.
C407.3	To demonstrate the concept of stress concentration for photo- elastic materials.
C407.4	To determine pressure distribution in journal bearings.
C407.5	To find the principal stresses using strain gauges.

C407.6	Knowing the concepts of whirling of shaft, governor, and gyroscope.

Course Name: CIM & Automation Lab 15MEL78

C408.1	To practically relate to concepts discussed in Computer Integrated Manufacturing Course.
C408.2	To write CNC part programs for simulation of machining operations such as Turning, Drilling & Milling.
C408.3	Ability to identify the type of machining center for the geometry given (cylindrical or prismatic), write the part program, explain the instructions, examine for the error in the program and choose right G and M codes to optimize the program and construct the final geometry by running the simulation using the software.
C408.4	To understand & write programs for Flexible Manufacturing Systems & Robotics.
C408.5	To understand the operating principles and practical applications of hydraulics, pneumatics and electro–pneumatic systems.
C408.6	To apply these learning's to automate & improve efficiency of manufacturing process.

Course Name: Operations Management 15ME81

C409.1	Understand the history and development of Operation Management. Able to apply the Operation Management principles in manufacturing and service activities. Getting exposure to Environmental and contemporary issues. Understands the Importance of Productivity and able to apply mathematics to improve productivity.
C409.2	Gets exposure to Decision making process in an industry under different environments, importance of decision making. Able to apply Mathematical models like Break even analysis and tradeoffs.
C409.3	Understands about the importance of forecasting, different methods of Fore casting. Able to apply forecasting methods like qualitative or quantity. Getting exposed to Measure and controlling of forecasting. Understands the use of Aggregate and Master Scheduling Techniques.
C409.4	Learns about the importance of Purchasing and Supply Chain Management. Gets exposure to different Methods of Procurement, Tendering process, vendor development. Understands the importance of maintaining Transparency in Purchasing activity and able to apply Procurement methods in an Industry or Service Sector.
C409.5	Gets exposure to the various skills required finding out the Capacity requirement of Plant and Machinery, Plant location, and Plant lay out. Able to apply the acquired skill in an Industry or Service Sector.
C409.6	Gets exposure in material requirement, inventory, importance of MRP and Able to apply the recent management techniques like MRP-1 and ERP in an industry or service sector. Able to apply different Inventory methods in a manufacturing or Service activity.

Course Name: Control Engineering 15ME82

C410.1	Describe the concept of control action, types of controllers and its applications relevant to the system.
C410.2	Apply the many inter-relationships in mechanical and electrical models.
C410.3	Evaluate the concept of block diagram reduction technique and SFG.
C410.4	Import the knowledge the step, ramp, and impulse input concepts by stability analysis
C410.5	apply the importance of root locus and bode plots
C410.6	Import the knowledge of lead-lag compensator and frequency response analysis.

Course Name: Power Plant Engineering 15ME831

C411.1	derstand Types of fuels and Equipment used for burning of coal in steam power plant.
C411.2	ppose ash handling, coal handling method in a thermal power plant.
C411.3	fferentiate Diesel engine power plants and Gas turbine power plants.
C411.4	lculate performance of a hydro-electric plant.
C411.5	plain working principle of different types of nuclear power plant.
C411.6	ect the suitability of site for a power plant and Indicate safety aspects of power plant.

Course Name: TRIBOLOGY 15ME831

C411.1	Describe the viscosity, Newton's law of viscosity.
C411.2	Apply knowledge of Hydrostatic and hydro dynamic lubrications.
C411.3	Evaluate the various types of bearing and its applications.
C411.4	Import the knowledge of oil flow and thermal equilibrium of journal bearing
C411.5	apply load carrying capacity and coefficient of friction
C411.6	Describe the wear, wear rate and its effects.

Course Name: Foundry Technology 15ME838

C411.1	Students can be able to demonstrate the Oxidation of liquid metals, gas dissolution in liquid metals, methods of degassing, fluidity, factors affecting fluidity, fluidity tests, hot tearing, shrinkage of liquid metals.
C411.2	Students can be able to understand the concept of Crystallization and development of cast structure and concept of progressive and directional solidification, need of gating system and rise ring system in casting methods.
C411.3	Students can be able to demonstrate the Special Molding Techniques for manufacturing different components by using different pattern, Developments in cupola melting–hot blast cupola, water cooled cupola, balanced blast cupola, coke less cupola, cupola charge calculations.

C411.4	Ferrous Foundry: Melting procedures, casting characteristics, production, specification, and properties of some ferrous metals.
C411.5	Students can be able to demonstrate the Non-Ferrous Foundry: Melting procedures, casting characteristics, production, specification, and properties of some typical aluminum, copper and magnesium-based alloy castings.
C411.6	Modernization and Mechanization in foundry techniques in molding, core, material handling equipment's.

Course Name:Biomass Energy System 15ME843

C412.1	Knowledge about the various biomass resources and its energy content.
C412.2	Analyze the conversion of biomass to biofuels for combustion process.
C412.3	Evaluate the performance of biomass-based steam power plant for power generation.
C412.4	Demonstrate the concepts of bio-Methanization process.
C412.5	Apply knowledge of biofuels in IC Engine Combustion.
C412.6	Know the biogas production.

Course Name: Project Work 15ME85L

C413.1	Applying knowledge emerging areas of engineering and technology.
C413.2	Students able to apply engineering concepts with respect to different mechanical streams.
C413.3	Students focusing on more efficiency at most economically.
C413.4	Students improve communication skills, problem analyzing ability, design, and development skills.
C413.5	Developing new ideas, creative thinking, improvement in reverse engineering in mechanical engineering related technology.
C413.6	Improve their skills to work in a team as a member, to manage project in interdisciplinary environment and to draw appropriate conclusion.

Course Name: Seminar 15ME86L

C414.1	Enhancing knowledge in emerging area of technology.
C414.2	Students self-learning through seminar which may enable in lifelong learning.
C414.3	Improve their skills to work in a team.
C414.4	Improve their knowledge in project management and brought out their concern for ethical valve.
C414.5	Develop new ideas, creative thinking, improve in reverse engineering in related technology.
C414.6	Reduce the stage fear in leadership qualities.

Department of Mechatronics

Vision of the Institute

To be a respected and most sought after engineering educational institution engaged in equipping individuals capable of building learning organizations in the new millennium.

Mission of the Institute

To develop competent students with good value systems and face challenges of the continuously changing world.

Vision of the Department

To develop the Mechatronics Engineering Department as a leading educational and research department with innovation in the design and development of electro-mechanical systems, intelligent machines, and products.

Mission of the Department

Mission 1. To provide an outstanding education in Mechatronics Engineering with a rich diversity of skills.

Mission 2. To contribute to the community prosperity through professional services and research.

Mission 3.To prepare graduates with ability to engage in life-long learning and capable of carrying out engineering practice with competence.

Program Educational Objectives

PEO 1.   Inculcate knowledge of basic engineering sciences and fundamentals of mechanical, electrical and computer systems.

PEO 2.   Create ability in graduates to design, develop product and applications in the field of Automation and Mechatronics and be able to use engineering tools that will enhance their productivity.

PEO 3.   Prepare graduates to be effective engineers with good analytical and problem-solving skill to innovate, research and develop in a multidisciplinary Mechatronics environment.

Program Specific Objectives

PSO 1: An ability to understand the concepts of Mechatronics Engineering and to apply them to various areas like Mechanical, Electrical machines, Signal processing, Embedded systems, Communication Systems, Digital & Analog Devices, Computer fields etc.

PSO 2: An ability to solve complex Mechatronics Engineering problems, using latest hardware and software tools, along with analytical skills to arrive cost effective and appropriate solutions.

PSO 3: Excellent adaptability to changing work environment with good leadership qualities and zeal for social and environmental well-being.

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Course Name:18MT32 - Material Science & Technology

C232.1	Appreciate the necessity of engineering materials, Smart Sensors, and its applications in various fields.
C232.2	Identify possible cause of failure due to fatigue and Creep.
C232.3	Demonstrate the knowledge of nucleation, Crystal growth, Solid solution, and Phase diagrams.
C232.4	Appreciate the significance and applications of Various heat treatment processes.
C232.5	Explain the definition and classification and fabrication processes of composite materials.
C232.6	Identify the role of Carbon content in the material and accordingly the type of material and properties of material changes like steel and cast iron

Course Name: 18MT33-Machanics Of Materials

C233.1	Analyze the normal stresses and strains for axially loaded members using Hooke's law
C233.2	Enumerate principal stresses and shear stresses for simple two-dimensional loadings
C233.3	Elucidate the stresses and strains in thick and thin cylindrical pressure vessels.
C233.4	Perform analysis of beams for static loading.
C233.5	Design torsional shafts and structural columns
C233.6	Calculate and represent the stress diagrams in bars and simple structures

Course Name: 18MT34- Control Systems

C234.1	Apply modeling knowledge in implementation physical systems.
C234.2	Understand the reduction of block diagram & analyze using Signal flow graph.
C234.3	Comment on performance of a system by evaluating various parameters.
C234.4	Model a system by applying the concept of State Space analysis
C234.5	Determine the time and frequency-domain responses of first and second-order systems to step and sinusoidal (and to some extent, ramp) inputs.
C234.6	Apply root-locus technique to analyze and design control systems

Course Name: 18MT35 - Analog & Digital Electronics

C235.1	Analyze the Importance & Applications of Diode as Rectifiers, Filters, Zener Diode Regulators & Switching Circuits.
C235.2	With the Knowledge of Active Filters & Oscillators students can better understand the Real-time Communication Systems
C235.3	Students are prepared to Understand, Analyze & Design Various Analog Electronics circuits if recruited to Analog Electronics Industry.
C235.4	Students are prepared to Understand, Analyze & Design Digital Circuits, if interested to work in VLSI Industry
C235.5	Formulate and employ a Karnaugh Map to reduce Boolean expressions and logic circuits to their simplest forms.

C235.6	Design and implement combinational logic circuits using reprogrammable logic devices. Content

Course Name: 18MT36 - Computer Organization

C236.1	Define Basic structure of computers, machine instructions and assembly language programs
C236.2	Ability to differentiate Addressing modes, output operations, Stacks and Queues has been described
C236.3	Understand the role and responsibilities of OS in the computer system.
C236.4	I/O Devices, Interrupts, Direct Memory Access, Busses, Interface Circuits, and Standard I/O Devices has been described
C236.5	Analyze the working of the memory system and basic processing unit.
C236.6	Understand the interfacing concepts in input and output module.

Course Name: 18MT42 - Fluid Mechanics and Machines

C242.1	Appreciate the fluid mechanics fundamentals, including concepts of mass and energy conservation.
C242.2	Apply the fundamentals to flow measurement problems.
C242.3	Perform dimensional analysis for problems in fluid mechanics.
C242.4	Appreciate the understanding of turbo machines and principles of energy transfer in turbo machines.
C242.5	Apply the fundamentals for energy transfer problems in various turbo machines.
C242.6	Identify the role of Carbon content in the material and accordingly the type of material and properties of material changes like steel and cast iron

Course Name: 18MT43 – Microcontroller

C243.1	Understand the difference between microprocessor and microcontroller, operation of Peripherals of controller, and be able to program a microcontroller system in assembly code and C.
C243.2	Interface the system to switches, keypads, displays, A/D and D/A converters and build a microcontroller-based Robot.
C243.3	Design and Develop a microcontroller-based system.
C243.4	Understand of 8051 Microcontroller concepts, architecture, programming and application of Microcontrollers.
C243.5	Understand the basic idea about the data transfer schemes and its applications
C243.6	Impart the knowledge about the instruction set

Course Name: 18MT44 - Manufacturing Technology

C244.1	Understand the principles and techniques of casting, forging, rolling & drawing.
C244.2	Apply the knowledge of metal working process.
C244.3	To express the different techniques of joining process for metal &non-metals.
C244.4	Understanding and applying knowledge to execute CNC machining programs
C244.5	Calculate and understand appropriate single-point machining relationships taking tool

C244.6	material and machine constraints into consideration.
	Understand the principles and appropriateness of non-traditional machining processes

Course Name: 18MT45 - Theory of Machines

C245.1	Explain the concepts of mechanism, machines, and types of motion, and calculate the mobility of a mechanism.
C245.2	Explain basic cam terminology, analyze various types of CAMS, and draw CAM profile diagrams.
C245.3	Determine the positions, velocities, and accelerations of links of simple mechanisms by using graphical approach.
C245.4	Demonstrate the knowledge of various transmission mechanisms like gears and belts and apply them for simple problems.
C245.5	Appreciate the principles of Balancing, Governors, and Gyroscope, and their applications
C245.6	Understand the fundamentals of machine design for desired kinematic or dynamic performance.

Course Name: 18MT46Instrumentation and Measurements

C246.1	Measure various electrical parameters with accuracy, precision, resolution.
C246.2	Use AC and DC bridges for relevant parameter measurement.
C246.3	Select appropriate passive or active transducers for measurement of physical phenomenon.
C246.4	Understand the errors in measurements and their rectification
C246.5	Understand the various measurement techniques available
C246.6	Understand the basic working of instruments used for measurement

Course Name: 17MT51 -Design of Machine Elements

C351.1	Have knowledge of theories of failures, stress concentration, power screws, shafts, keys, couplings, gears, bearings, and springs.
C351.2	Understand the technique of theories of failure, stress concentration, fatigue strength etc.
C351.3	Calculate the stresses; parameters of machine elements subjected to various loads also make proper assumptions with respect to material, FOS for various machine components.
C351.4	Design machine elements like couplings, gears, bearings ad springs
C351.5	Design machine elements like power screws.
C351.6	Design machine elements like shafts, keys.

Course Name: 17MT52 - Virtual Instrumentation

C352.1	Gain knowledge of Virtual Instrumentation and Lab View domain on various I/O Module, Sensor, DAQDevices, Communication and Measurement System
C352.2	Understanding the basic programming concepts and various logical Instructions.

C352.3	Determine the extent and nature of electronic circuitry in Virtual Instrumentation
C352.4	Recognize the components of virtual instrumentation and use them for PC based Measurement.
C352.5	Publish Vis front panels on the web, view and control them remotely from LabVIEW or from a web
C352.6	Develop real time application using LabVIEW

Course Name: 17MT53 - Hydraulics& Pneumatics

C353.1	Engineering applications of hydraulic system
C353.2	Engineering applications of pneumatic system
C353.3	Gain knowledge of basis of hydraulic system
C353.4	Gain knowledge of basis of pneumatic system
C353.5	Understanding the working principle of hydraulic system
C353.6	Understanding the working principle of pneumatic system

Course Name: 17MT54Micro and Smartsystemtechnology

C354.1	Know the basic concept of micro and smart system technology.
C354.2	Understand the need of micro size machines and devices.
C354.3	Know how this micro system technology is evolved in all fields of science amd technology
C354.4	Know the smart materials and their characteristics for the smart system applications.
C354.5	Understand the working of different sensors for smart system applications.
C354.6	Know how the different components of smart systems ate integrated with each other.

Course Name: 17MT551Wireless Network & Communication

C355.1	Have Knowledge of the fundamental concepts of wireless communication and networks.
C355.2	To understand the basics of wireless voice and data communication
C355.3	Differentiation between Wireless LAN, Wireless MAN, Wireless WAN
C355.4	Understand the working of modern network architectures from a design and performance perspective.
C355.5	Design requirements of network architectures
C355.6	Brief description regarding different wireless networks.

Course Name: 17MT562- Automation in Manufacturing

C356.1	Know the fundamentals of automation in manufacturing
C356.2	Need of automation in manufacturing
C356.3	Types of automation process and its requirement
C356.4	Knowledge about quality control and its requirement
C356.5	Understand the techniques of automation in manufacturing
C356.6	Operations performed in manufacturing industry

Course Name: 17MT61 - PLC &SCADA

C361.1	Describe typical components of a Programmable Logic Controller.
C361.2	Explain the basic concepts of a Programmable Logic Controller.
C361.3	Use timer, counter, and other intermediate programming functions.
C361.4	Design and program basic PLC circuits for entry-level PLC applications.
C361.5	Design and program a small, automated industrial production line.
C361.6	Explain SCADA basic concept and application process,

Course Name: 17MT62 -Embedded System (ARM)

C362.1	Gain the knowledge of various RISC and CISC architectures of processors
C362.2	Know the different register usage in processor core
C362.3	Know the function of Embedded system hardware and software components,
C362.4	Have knowledge of embedded system based on the ARM processor, various cache methods and instruction set.
C362.5	Understand the various instruction set for writing and optimizing ARM assembly and C code
C362.6	Able to optimize error in programming and debug error code in efficient way.

Course Name: 17MT63- Power Electronics

C363.1	Have knowledge of power semiconductor devices, thyristors, AC voltage controllers.
C363.2	Have knowledge of choppers and inverters.
C363.3	Understand the characteristics and working principle of thyristors, AC voltage controllers.
C363.4	Understand the characteristics and working principle of choppers and inverters.
C363.5	Apply control techniques to meet desired switching objectives.
C363.6	Analyst the importance and applications of diode as rectifiers, filters, Zener diode, regulators and switching circuits.

Course Name: 17MT64Computer Aided Machine Drawing

C364.1	Have knowledge about Engineering Drawing
C364.2	Understand the concepts of sections of solids, orthographic views.
C364.3	Understand the concepts of threads, fasteners, couplings.
C364.4	Understand the concepts of joints and assembly drawing.
C364.5	Understand the concepts of Detailing.
C364.6	Students will be able to demonstrate the usage of CAD software

Course Name: 17MT652- Rapid Prototyping

C365.1	Have fundamental knowledge of modeling and simulation.
C365.2	Understand the techniques of discrete event simulation, random number generation.
C365.3	Understand the techniques to test for random number,
C365.4	Understand the techniques of random variants used in simulation study & simulation packages.
C365.5	Apply simulation packages for queuing system.

C365.6	Apply simulation packages for production system and maintenance system.

Course Name: 17MT662- Process Instrumentation

C366.1	Have the knowledge of Joints, Links.
C366.2	Have the knowledge of Sensors.
C366.3	Have the knowledge of Control units
C366.4	Have the knowledge of Actuators.
C366.5	Have the knowledge of Elements of Automation.
C366.6	**D**escribe motions and control system of Robots**.**

Course Name: 15MT71_ : Industrial Robotics

C471.1	Gain knowledge of Robotics
C471.2	Gain knowledge of robotics in Automation
C471.3	Understand the working Methodology of Robotics and Automation
C471.4	Knowledge of robotics motion and sensors
C471.5	Write the program for Robot for various Application
C471.6	Knowledge of Robotic Control system and machine vision

Course Name: 15MT72: Thermal Engineering

C472.1	Understand the concepts of systems, energy interaction in systems and types
C472.2	Understand the energy interaction and thermodynamicsequilibrium
C472.3	Know the thermodynamics concepts related terms
C472.4	Understand the difference between heat and work different process related to work
C472.5	Know the first law of thermodynamics to cyclic process and properties
C472.6	Understand steady flow energy equation for open system

Course Name: 15MT73 _Signal Processing

C473.1	Gain the Knowledge of signals and system transformation and filter
C473.2	Understand timedomain, frequency domain signals analog and digital system
C473.3	Operate on signals and systems to bring out this characteristicsand desired information
C473.4	Design Analog and Digital filters and implement discrete time systems
C473.5	Understand the basics of convolution sum and integral
C473.6	Properties of signals signal operation

Course Name: 15MT743- Real Time System

C474.1	Explain the types of real time systems and their properties
C474.2	Know concept of computer control
C474.3	Understand hardware and software requirements
C474.4	Know the languages for real time application
C474.5	Know the concept & working operation of operating systems
C474.6	Design RTSS and RTS developing Methodologies

Course Name: 15MT753 Safety & Security of System

C475.1	Have knowledge of IC Engines
C475.2	Have knowledge of Fuel, ignition, Lighting System
C475.3	Understand the working principle of Transmission System
C475.4	Understand the working principle of gear box
C475.5	Understand the working principle of Lubrication System
C475.6	Know about CMV safety rules

Course Name: 15MT81 Automotive Electronics & Hybrid vehicles

C481.1	Have knowledge of automotive electronics domain of various engine parts
C481.2	Have knowledge of automotive electronics sensors and types of sensors
C481.3	Know the electronics domain of various engine parts sensors, actuators, communication, and measurement system
C481.4	Understanding engine parameters and a critical awareness of current problems within the automotive electronics domain using various measurement technology
C481.5	Determine the extent and nature of electronic circuitry in automotive system including monitoring and control circuits for engines transmissions, brakes, steering, suspension, climate control system
C481.6	Understand the monitoring and control circuits for engines and instrumentations and radios and accessories involved in automotive industry

Course Name: 15MT-82- Communication System

C482.1	Know about communication systems, transmitter, receiver, and modulation in communication system.
C482.2	Know concepts of amplitude modulation and its types, coherent detection of different signals.
C482.3	Gain knowledge on angle modulation and demodulation, FM, and its types.
C482.4	Gain knowledge on phase locked loop, linear and nonlinear effects in FM systems.
C482.5	Know different waveform coding techniques.
C482.6	Gain knowledge on spread spectrum modulation, digital multiplexers, and its types.

Course Name: 15MT83 –Artificial Intelligence

C483.1	Understand the importance of Artificial systems, their domain details.
C483.2	Analyze the different Techniques used and algorithm applied to the system along with the system characteristics.
C483.3	Gain Knowledge of Artificial Intelligence, Production Rules, Search Algorithms, Expert System & its architectures, Machine Learning.
C483.4	Understand the working methodology of Search Algorithms, Expert System & Machine Learning.
C483.5	Ability to apply Artificial Intelligence techniques for problem solving.
C483.6	Explain the limitations of current Artificial Intelligence techniques.

Department of Physics

Vision of the Institute

To be a respected and most sought after engineering educational institution engaged in equipping individuals capable of building learning organizations in the new millennium.

Mission of the Institute

To develop competent students with good value systems and face challenges of the continuously changing world.

Vision of the Department

To inculcate interest in Physics and promote the understanding of it, and to develop observational and computational skills, which will take the development in technology to new heights.

Mission of the Department

The department has been working towards fulfilling its vision through a synergic combination of teaching and research. The department also strives to promote excellence in technical education and scientific research through the effective use of Physics in real time engineering problems.

Program Educational Objectives

PEO 1.   Inculcate knowledge of basic engineering sciences and fundamentals of mechanical, electrical and computer systems.

PEO 2.   Create ability in graduates to design, develop product and applications in the field of Automation and Mechatronics and be able to use engineering tools that will enhance their productivity.

PEO 3.   Prepare graduates to be effective engineers with good analytical and problem-solving skill to innovate, research and develop in a multidisciplinary Mechatronics environment.

Program Specific Objectives

PSO 1:Learn & understand more about basic principles & to develop problem solving skills and implementation in technology.

PSO 2: Study of material properties and their applications is the prime role to understand and use in engineering applications and studies.

PSO 3: Develop skills to impart practical knowledge in real time solution.

PSO 4: Understand measurement technology, usage of new instruments and real time applications in engineering studies.

Course Name: 18CHE12/22 (Engineering Physics)

CO1	Apprehend theoretical background of laser, construction and working of different types of laser and its applications in different fields and Compute Eigen values, Eigenfunctions, momentum of Atomic and subatomic particles using Time independent 1-D Schrodinger's wave equation.
CO2	Understand various electrical and thermal properties of materials like conductors, semiconductors, dielectrics using different theoretical models.
CO3	Understanding different types of optical fibers and their applications
CO4	Realize the interrelation between time varying electric field and magnetic field, thetransverse nature of the EM waves and their role in optical fiber communication.
CO5	Understand various types of oscillations and their implications, the role of Shock waves in various fields.
CO6	Recognize the elastic properties of materials for engineering applications