VIGHNAHARATA TRUST'S

SHIVAJIRAO S. JONDHLE COLLEGE OF ENGINEERING & TECHNOLOGY, ASANGAON

Approved By AICTE,New Dehli ,Recognised by DTE & Govt. Of Maharashtra & Affilated To University Of Mumbai

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Program Outcomes for AY 2022-23

1	**PO1.Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	**PO**2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	**PO**3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4	**PO**4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5	**PO**5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6	**PO**6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7	**PO**7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	**PO**8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	**PO**9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	**PO**10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11	**PO**11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12	**PO12. Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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Program Specific Outcomes for all Deparment for AY 2022-23

Sr.No	Name of Department	List Of Program Specific Outcomes
1	ELECTRONICS AND TELECOMMUNICATION ENGG	**PSO 1:** Apply fundamentals of electronics in various domains of analog and digital systems.
		PSO 2: Build a model by applying profound knowledge in Communication, Signal Processing, Image Processing and VLSI along with programming & simulation tools for research and advancement.
		PSO 3: Analyze and research appropriate technologies for implementation of the electronics and telecommunication engineering systems and exhibits the soft skills for the presentation of the systems.
2	COMPUTER ENGINEERING	**PSO 1:** Understand,analyze and develop computer programs, hardware and software based systems to evaluate and recognized potential risks and provide craetive solutions.
		PSO 2: Apply standard practices, knowledge and strategies in software project development to deliver a quality product.
3	MECHANICAL ENGINEERING	**PSO 1: S**olve problems in the field of design, thermal and Production Engineering.
		PSO 2:Analyze mechanical systems and simulate using Software
		PSO 3: Resolve issues related to renewable energy sources and contribute to reduce atmospheric pollution
4	CIVIL ENGINEERING	**PSO1** : Plan, analyze, construct and maintain cost effective civil engineering structures.
		PSO2: Take up employment, entrepreneurship, research and development for sustainable civil society.
		PSO3 : Recognize the need of the hour like housing, sanitation, waste management, irrigation, use of renewable energy etc. for a sustainable environment.
5	MASTER OF MANAGEMENT	**PSO1:** Apply conceptual foundations of management to solve practical decision-making problems.
		PSO2: Excellent adaptability to function in multi-disciplinary work environment, good. Interpersonal skills as a leader in a team in appreciation of professional ethics and societal responsibilities.
		PSO3: Providing opportunities to students for competing in corporate world characterized bydiversity, rapid technological development, and a fiercely competitive marketplace.

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DEPARTMENT OF FIRST YEAR ENGINEERING

ACADEMIC YEAR 2022-23

YEAR: FE **SEM: I** **SCHEME:C**

COURSE OUTCOMES

SR.NO	SUBJECT	COURSE OUTCOMES
1	ENGINEERING MATHMATICS-I (FEC101)	Apply the basic concept of complex numbers and will be able to use it for engineering programs .
		Apply hyperbolic functions and logarithms in the subject like electrical circuit.
		Apply the basic concept of partial differentiation of functions of several variables and use in subjects like electromagnetic theory.
		Apply the concept of maxima ,minima and successive will be able to use it for optimization and tuning the systems.
		Apply the concept of matrices and will be able to use it for solving engineering programs.
		Apply the concept of numerical methods for solving the engineering programs with the help of scilab software.
2	ENGINEERING PHYSICS-I(FEC102)	Illustrate the fundamentals of Quantum Mechanics & apply the knowledge of Quantum Mechanics to uncertainty principle & motion of free particle.
		Illustrate the knowledge of crystal planes, X- ray diffraction & use XRD technique to determine crystal structure.
		Illustrate the knowledge of Fermi level in semiconductors & applications of semiconductors in electronic devices.
		Illustrate the knowledge of interference in thin films & use this knowledge to Antireflecting & Highly reflecting film.
		Illustrate the basic knowledge of superconductors & supercapacitors.
		Illustrate the knowledge of engineering materials like multiferroics & its application.
3	ENGINEERING CHEMISTRY-I (FEC103)	Explain the concept of atomic and molecular orbital theory and relate it to diatomic molecule.
		Describe the concept of aromaticity and interpret it with relation to specific aromatic systems
		Explain the various types of intermolecular forces and relate it to real gases.
		Understand thermodynamics in studying different chemical systems in equilibrium obeying Gibb's phase rule.
		Describe chemistry of polymers, apply knowledge of various polymers in their classification synthesis, properties and uses along with their compounding and fabrication techniques.
		Describe types of hardness of water and its estimation & Calculate percentage of impurities in water, apply the knowledge of various softening and disinfecting methods.
4	ENGINEERING MECHANICS (FEC104)	Illustrate the concept of force, moment and apply the same along with the concept of equilibrium in two and three dimensional systems with the help of FBD.
		Demonstrate the understanding of Centroid and its significance and locate the same.
		Correlate real life application to specific type of friction and estimate required force to overcome friction.
		Establish relation between velocity and acceleration of a particle and analyse the motion by plotting the relation.
		Illustrate different types of motions and establish Kinematic relations for a rigid body
		Analyse particles in motion using force and acceleration, work energy and impulse momentum principles.
5	BASIC ELECTRICAL ENGINEERING (FEC105)	Apply various network theorems to determine the circuit response / behaviour.
		Evaluate and analyse 1-Φ circuits.
		Evaluate and analyse 3-Φ AC circuits.
		Explain the constructional features and operation of 1-Φ transformer.
		Illustrate the working principle of 3-Φ machine.
		Illustrate the working principle of 1-Φ machines.

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6	ENGINEERING PHYSICS-I(FEL101)	Perform the experiment based on interference in thin film & analyse the result.
		Verify the theory learned in module Crystallography.
		Perform the experiment on Hall effect & determine Hall coefficient.
		Perform the experiment on junction diode & analyse I/V charecteristics of diode.
		Perform the experiment on Zener diode & analyse its use.
7	ENGINEERING CHEMISTRY-I (FEL102)	Demonstrate Chloride content and hardness of water sample.
		Demonstrate free acid ph of different solutions.
		Demonstrate metal ion concentration.
		Synthesize polymers, biodegradable plastics.
		Demonstrate Viscosity of oil.
8	ENGINEERING MECHANICS (FEL103)	Illustrate the concept of force, moment and apply the same along with the concept of equilibrium in two and three dimensional systems with the help of FBD.
		Demonstrate the understanding of Centroid and its significance and locate the same.
		Correlate real life application to specific type of friction and estimate required force to overcome friction.
		Establish relation between velocity and acceleration of a particle and analyse the motion by plotting the relation.
		Illustrate different types of motions and establish Kinematic relations for a rigid body.
		Analyse particles in motion using force and acceleration, work-energy and impulse momentum principles.
9	BASIC ELECTRICAL ENGINEERING (FEL104)	Determine and analyse the behaviour of DC circuits using network theorems.
		Perform and infer experiment on single phase AC circuits.
		Demonstrate experiment on three phase AC circuits.
		Illustrate the performance of single phase transformer.
		Illustrate the performance of D C Machines.
10	WORKSHOP PRACTICS-I(FEL105)	Develop the necessary skill required to handle/use different fitting tools.
		Develop skill required for hardware maintenance.
		Install an operating system and system drives.
		Identify the network components and perform basic networking and crimping.
		Able to prepare the edges of jobs and do simple arc welding.
		Develop the necessary skill required to handle/use different plumbing tools.
		Demonstrate the turning operation with the help of a simple job

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DEPARTMENT OF FIRST YEAR ENGINEERING

ACADEMIC YEAR 2022-23

YEAR: FE **SEM: II** **SCHEME:C**

COURSE OUTCOMES

SR.NO	SUBJECT	COURSE OUTCOMES
1	ENGINEERING MATHMATICS-II (FEC201)	Apply the basic concept of first order and first degree differential equation to the problems in the field of engineering.
		Apply the concepts of higher order linear differential equation to the engineering programs.
		Apply the concept of beta and gamma function to solve improper integrals.
		Apply the concept of double integral of different coordinate systems to the engineering programs like area and mass.
		Apply the concept of triple integral of different coordinate systems to the engineering programs and problems based on volume of solids.
		Solve differential equations and integratios numerically using scilab software to experimental aspects of Engineering mathematics.
2	ENGINEERING PHYSICS-II(FEC202)	Describe the diffraction through slits and its applications.
		Apply the foundation of laser and fiber optics in development of modern communication technology.
		Relate the basics of electrodynamics which is prerequisite for satellite communications, antenna theory etc.
		Explain the fundamentals of relativity.
		Assimilate the wide scope of nanotechnology in modern developments and its role in emerging innovating applications.
		Interpret and explore basic sensing techniques for physical measurements in modern instrumentations.
3	ENGINEERING CHEMISTRY-II (FEC203)	Describe the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.
		Explain the concept of emission spectroscopy and describe the phenomena of fluorescence and phosphorescence in relation to it.
		Explain the concept of electrode potential and nernst theory and relate it to electrochemical cells.
		Describe Types of Corrosion, Factors affecting the rate of corrosion, Proper designing, Use of inhibitors.
		Describe Twelve Principles of Green chemistry, numerical on atom economy, Conventional and green synthesis.
		Apply classification of fuels-solid, liquid and gaseous., Cracking- Definition, Types of cracking, Combustion.
4	ENGINEERING GRAPHICS (FEC204)	Apply the basic principles of projections in Projection of Lines and Planes.
		Apply the basic principles of projections in Projection of Solids.
		Apply the basic principles of sectional views in Section of solids.
		Apply the basic principles of projections in converting 3D view to 2D drawing.Read a given drawing.
		Visualize an object from the given two views.
5	C PROGRAMMING (FEC205)	Illustrate basic terminologies and various models of computation and will be able to write and draw algorithms and flowcharts, to Illustrate the concept of data types, variables and operators using C.
		learn the concept of flow of controls, Design and Implement control statements, branching and looping constructs in C
		Apply function concept on problem statement and will be able to understand recursion.
		learn the concept of flow of controls and program structures and will learn the use of arrays ,strings
		Demonstrate the use of strings and structures,unions in C language
		use of pointers and file operations.

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6	PROFESSIONAL COMMUNICATION AND ETHICS- I (FEC206)	Eliminate barriers and use verbal/non-verbal cues at social and workplace situations.
		Employ listening strategies to comprehend wide-ranging vocabulary, grammatical structures, tone and pronunciation.
		Prepare effectively for speaking at social, academic and business situations.
		Use reading strategies for faster comprehension, summarization and evaluation of texts.
		Acquire effective writing skills for drafting academic, business and technical documents.
		Successfully interact in all kinds of settings, displaying refined grooming and social skills.
7	ENGINEERING PHYSICS-II(FEL201)	Perform the experiments based on diffraction through slits using Hg source and analyse the results.
		Perform the experiments based on diffraction through slits using Laser source and analyse the results.
		Perform the experiments based on diffraction through slits using Laser source and analyse the results.
		Perform the experiments based on diffraction through slits using Laser source and analyse the results.
		Perform the experiments using optical fibre to measure numerical aperture of a given fibre.
		Perform the experiments on ultrasonic transducer for distance measurement and analyse the result.
8	ENGINEERING CHEMISTRY-II (FEL202)	Demonstrate moisture and ash content of coal.
		Demonstrate saponification and acid value of oil.
		Demonstrate flash point of a lubricating oil.
		Synthesize a drug and a biofuel.
9	ENGINEERING GRAPHICS (FEL203)	Make use of command to draw 2D drawing using software.
		Apply to convert given 3D into 2D views using tools in software.
		Apply convert given 2D into 3D drawing using software .
10	C-PROGRAMMING (FEL204)	Translate given algorithms to a program.
		Correct syntax and logical errors.
		Write iterative as well as recursive programs.
		Represent data in arrays, strings and structures and manipulate them through a program.
		Declare pointers and demonstrate call by reference concept
11	PROFESSIONAL COMMUNICATION AND ETHICS- I (FEL205)	Listen and comprehend all types of spoken discourse successfully.
		Speak fluently and make effective professional presentations.
		Read large quantities of text in a short time to comprehend, summarise and evaluate Content.
		Draft precise business letters, academic essays and technical guidelines.
		Dress finely and conduct themselves with panache in social, academic and professional situations.
12	WORKSHOP PRACTICS-II(FEL206)	Develop the necessary skill required to handle/use different carpentry tools.
		Identify and understand the safe practices to adopt in electrical environment.
		Demonstrate the wiring practices for the connection of simple electrical load/ equipment.
		Design, fabricate and assemble PCB.
		Develop the necessary skill required to handle/use different mason's tools.
		Develop the necessary skill required to use different sheet metal and brazing tools.
		Demonstrate the operation, forging with the help of a simple job.

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DEPARTMENT OF AUTOMATION & ROBOTICS

ACADEMIC YEAR 2022-23

YEAR: SE **SEM: III** **SCHEME: C (R-19)**

COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Applied Mathematics-III (ARC301)	Apply the concept of Laplace transform to solve the real integrals in engineering problems.
		Apply the concept of inverse Laplace transform of various functions in engineering problems.
		Expand the periodic function by using Fourier series for real life problems and complex engineering problems.
		Find orthogonal trajectories and analytic function by using basic concepts of complex variable theory.
		Apply Matrix algebra to solve the engineering problems.
		Solve Partial differential equations by applying numerical solution and analytical methods for one dimensional heat and wave equations
2	Strength of Materials (ARC302)	Demonstrate fundamental knowledge about various types of loading and stresses induced.
		Draw the SFD and BMD for different types of loads and support conditions.
		Analyze the stresses induced in basic mechanical components.
		Estimate the strain energy in mechanical elements.
		Analyze the deflection in beams.
		Analyze buckling and bending phenomenon in columns, struts and beams.
3	Electronics devices and Electrical Networks (ARC303)	Analyse DC circuits using different theorems
		Evaluate transient and steady state values of passive electrical networks
		Synthesize the networks using canonical forms
		Demonstrate the application of diodes and formulate the DC analysis of BJT.
		Apply the basic construction and characteristics of FET and MOSFET and to formulate the DC analysis of FET.
		Discuss the power amplifiers and design power supply using different IC
4	Digital Electronics (ARC304)	Represent numerical values in various number systems and perform number conversions between different number systems.
		Analyze and design, digital combinational circuits using logic gates with IEEE/ANSI standard symbols.
		Formulate and design sequential logic circuits.
		Formulate and design asynchronous sequential logic circuits.
		Explain nomenclature and technology in memory devices
		Apply the concept of logic families and their application to design the digital system.

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5	Transducers (ARC305)	Explain the measurement systems, errors of measurement. List and compare various standards used for selection of transducers/sensors.
		Describe the working principles of displacement and Temperature transducers and their applications.
		Formulate and design the solutions for given applications using appropriate level, speed, vibration sensors and transducer
		Explain working, principle of strain gauges and pressure transducer.
		Identify types of flow and use different transducers for flow measurement.
		Explain the terminologies of electrochemical sensors and their applications in industry. Identify sensors for power, density, humidity, PH measurement.
6	Strength of Materials and Transducers Lab (ARL301)	Plot and validate the performance characteristics of displacement transducers
		Validate the characteristics of various temperature transducers.
		Describe the construction and operation of various level transducers.
		Explain the working principles of strain gauges and pressure transducers.
		Learn basic fundamentals of flow transducers, identify types of flow and use different transducers for flow measurement, along with tension tests
		Demonstrate the performance characteristics of miscellaneous transducers and perform hardness test on metals
7	Electronic devices and Electrical Networks Lab (ARL302)	Analyse DC circuits using different theorems
		Evaluate transient and steady state values of passive electrical networks.
		Synthesize the networks using canonical forms
		Demonstrate the application of diodes and formulate the DC analysis of BJT.
		Apply the basic construction and characteristics of FET and MOSFET and to formulate the DC analysis of FET.
		Discuss the power amplifiers and design power supply using different IC
8	Digital Electronics- Lab (ARL303)	Demonstrate numerical values in various number systems and perform number conversions between different number systems.
		Exemplify operation of logic gates using IEEE/ANSI standard symbols. Analyze and design, digital combinational circuits.
		Design and validate sequential logic circuits.
		Design and verify asynchronous sequential logic circuits
		Demonstrate nomenclature and technology in memory devices.
		Analyze logic families and their application to design the digital system
9	Skill Based Lab: Object Oriented Programming with Java (ARL304)	To apply fundamental programming constructs
		To illustrate the concept of packages, classes and objects.
		To elaborate the concept of strings, arrays and vectors.
		To implement the concept of inheritance and interfaces.
		To implement the concept of exception handling and multithreading.
		To develop GUI based application.

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10	Mini Project - 1A (ARM 301)	Identify problems based on societal /research needs.
		Apply Knowledge and skill to solve societal problems in a group.
		Develop interpersonal skills to work as member of a group or leader.
		Draw the proper inferences from available results through theoretical/experimental/simulations.
		Analyse the impact of solutions in societal and environmental context for sustainable development.
		Use standard norms of engineering practices
		Excel in written and oral communication.
		Demonstrate capabilities of self-learning in a group, which leads to lifelong learning
		Demonstrate project management principles during project work

YEAR: SE **SEM: IV** **SCHEME: C (R-19)**

COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Applied Mathematics-IV (ARC401)	Apply the concept of Vector calculus to evaluate line integrals, surface integrals using Green's theorem, Stoke's theorem & Gauss Divergence theorem.
		Use the concepts of Complex Integration for evaluating integrals, computing residues & evaluate various contour integrals.
		Apply the concept of Correlation, Regression and curve fitting to the engineering problems in data science
		Illustrate understanding of the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.
		Apply the concept of probability distribution to engineering problems & testing hypothesis of small samples using sampling theory.
		Apply the concepts of parametric and nonparametric tests for analyzing practical problems.
2	Embedded System (ARC402)	Explain the architecture of embedded systems.
		Design systems to use the MCS51 and ARM features.
		Design applications using peripherals of MCS51 microcontroller.
		Design and develop interfacing circuits of advanced peripheral components with MCS51.
		Explain the architecture of M0+ ARM processors.
		Investigate, recommend and design sophisticated applications based on MCS-51/ARM.
3	Automatic Control Systems (ARC403)	Identify open and closed loop control system
		Formulate mathematical model and transfer function for physical systems
		Use standard test signals to identify performance characteristics of first and secondorder systems.
		Apply root locus technique for stability analysis.
		Analyse performance characteristics of system using Frequency response
		Formulate state variable model for mechanical and electrical systems.

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4	Signal Conditioning Circuit Design (ARC404)	Describe op-amp parameters and types and derivation of operational amplifiers
		Design the various operation amplifier circuits for linear applications.
		Formulate and design non-linear applications of op-amp.
		Design of analog signal conditioning circuits\
		Design of Digital signal conditioning circuits
		Apply signal conditioning concepts to design various transducer/ sensors signal conditioning circuits
5	Components of Automation and Robotics (ARC405)	Explain and select various pneumatic system components and circuits.
		Select and compare various control systems like Hydraulic, pneumatic and electric.
		Apply knowledge to classify, select and use various transmitters.
		Classify and select various control valves and their accessories.
		Describe and select industrial components and study their usage
		Demonstrate major components of industrial robot.
6	Embedded Systems and SCCD - Lab (ARL401)	Develop programs to configure the peripherals in 8051/ARM and to design and interface peripheral components with MCS 51/ARM.
		Design programs to use interrupt in 8051/ARM.
		Design and interface peripheral components using communication protocols.
		Design and implement various linear and non-linear applications using op-amp.
		Apply principles of analog signal conditioning for op-amp based circuit design.
		Apply concepts of digital signal conditioning for op-amp based circuit design
7	Automatic Control System – Lab (ARL402)	Plot time and frequency response of first-order electrical system.
		Plot time response of second-order system and calculate the steady state error.
		Demonstrate the way to obtain the transfer function and validate transient and steadystate response using test signals such as step, ramp, and parabolic.
		Inspect the time response specifications of systems by using root-locus.
		Inspect the frequency response specifications of systems by using bode-plot, Polar plot, Nyquist-plot techniques, and comment on the stability of system.
		Verify the controllability and observability of the given systems
8	Components of Automation and Robotics systems - Lab (ARL403)	Explain working principle of strain gauges, pressure transducers
		Learn Basic fundamentals of flow transducers identify types of flow and use different transducers for flow measurement.
		Explain the terminologies of electrochemical, density, humidity, pH measurementsensors, and their applications in industry.
		Study, select and implement various pneumatic, hydraulic and electro-pneumatic system components and circuits.
		Apply knowledge to classify, select and use various Transmitters, control valves and their accessories
		Describe the Need of Auxiliary process control components and study their industrial usage.

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9	Skill based Lab Course: Python Programming (ARL404)	Describe syntax and semantics in Python
		Illustrate different file handling operations
		Interpret object-oriented programming in Python
		Design GUI Applications in Python
		Express proficiency in the handling Python libraries for data science
		Develop machine learning applications using Python
10	Mini Project - 1B (ARM 401)	Identify problems based on societal/research needs.
		Apply Knowledge and skill to solve societal problems in a group.
		Develop interpersonal skills to work as member of a group or leader.
		Draw the proper inferences from available results through theoretical/experimental/simulations.
		Analysetheimpactofsolutionsinsocietalandenvionmentalcontextforsustainabledevel opment.
		Use standard norms of engineering practices
		Excel in written and oral communication
		Demonstrate capabilities of self-learning in a group, which leads to lifelong learning
		Demonstrate project management principles during project work.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-23

COURSE OUTCOMES (UG)

SEM-III

SR. NO	SUBJECT	COURSE OUTCOMES
1	Engineering Mathematics-III (CEC301)	Apply the concept of Laplace Transform to solve real integrals in engineering problems.
		Apply the concept of Inverse Laplace Transform to various functions in engineering problems.
		Expand the periodic function by using Fourier series for real life problems & complex engineering problems.
		Find orthogonal trajectories and analytic function by using basic concepts of complex variable theory.
		Apply Matrix algebra to solve engineering problems.
		Solve Partial differential equations by applying numerical solution and analytical methods for one dimensional heat and wave equations.
2	Mechanics of Solids (CEC302)	Evaluate stress - strain behavior of elastic members and thin cylinders subjected to internal pressure.
		Draw variation of axial force, shear force and bending moment diagram for statically determinate beams and frames.
		Calculate Moment of Inertia for cross sections and analyse the material response under theaction of shear and the effect of flexure (bending).
		Predict the angle of twist and shear stress developed in torsion and compute direct and bending stresses developed in the cross section of centrally and eccentrically loaded columns.
		Locate principal planes in members and calculate principal stresses using analytical and graphical method and to calculate strain energy stored in members due to elastic deformation.
		Evaluate slope and deflection of beams supported and loaded in different ways.
3	Engineering Geology (CEC303)	Explain the concepts of Geology and its application for safe, stable and economic design of any civil engineering structure.
		Interpret the lithological characters of the rock specimen and distinguish them on the basis of studied parameters.
		Describe the structural elements of the rocks and implement the knowledge for collection and analysis of the geological data.
		Interpret the geological conditions for the dam site and calculate RQD for the assessment of rock masses.
		Analyze the given data and suggest rock mass rating for assessment of tunnelling conditions.
		Interpret the causes of geological hazards and implement the knowledge for their prevention
4	Architectural Planning & Design of Buildings (CEC304)	Remember and recall the intricate details of building design and drawing.
		Understand the basic concepts of building design and drawing.
		Learn how to apply professional ethics and act responsibly pertaining to the norms of building design and drawing practices.
		Identify, analyze, research literate and solve complex building design and drawing problems.
		Have new solutions for complex building design and drawing problems.
		Effectively communicate ideas, related to building design and drawing, both orally as well as in written format like reports & drawings.
5	Fluid Mechanics – I (CEC305)	Describe various properties of fluids and types of flow.
		Determine the pressure difference in pipe flows, application of Continuity equation and Bernoulli's theorem to determine velocity and discharge.
		Apply hydrostatic and dynamic solutions for fluid flow applications.
		Analyse the stability of floating bodies.
		Apply the working concepts of various devices to measure the flow through pipes and channels.
		Explain the compressible flow, propagation of pressure waves and stagnation properties.

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6	Mechanics of Solids (CEL301)	Evaluate stress - strain behavior of materials and assess the structural behavior by the virtue of stresses developed and deformation of elastic members.
		Analyze the material response under the action of shear and the effect of flexure (bending).
		Predict the angle of twist and shear stress developed in torsion.
		Evaluate slope and deflection of beams supported and loaded in different ways.
7	Engineering Geology (CEL302)	Identify various rock forming minerals on the basis of physical properties.
		Explain the characteristics of Igneous, Sedimentary and Metamorphic rocks and assess their suitability as construction material and foundation rock.
		Interpret the rock characteristics and comment on their suitability as water bearing horizons.
		Interpret the geological map and assess the suitability of the site for Civil Engineering works
		Solve the borehole problems and interpret it in order to understand subsurface Geology of the area.
		Calculate RQD and evaluate the rock masses for Civil Engineering Works.
8	Architectural Planning & Design of Buildings (CEL303)	Plan and design of residential and public building by implementing the principles of planning of buildings, Green building principles, byelaws, regulations and codes for planning.
		Preparing various working and detailed drawing of the buildings in CAD.
		Preparing layouts of various building services.
		Preparing perspective views for all types of buildings.
		Preparing the reports based on the drawings prepared, if required.
9	Fluid Mechanics – I (CEL304)	Calculate the metacentric height of a floating body.
		Find out coefficient of discharge through venturimeter.
		Determination of coefficient of discharge through orifice meter.
		Determination of coefficient of discharge through rectangular and triangular notch.
		To determine the value of coefficient of contraction, velocity and discharge for the given orifice.
10	Skill Based Lab Course – I (CEL305)	Transfer the plan from a drawing sheet to a 2-D drafting software.
		Visualize the various elements in the software like points, lines, polygons, etc. as objects of the real world and relate it with civil engineering components
		Apply civil engineering concepts to draft efficient civil engineering plans in accordance to various building bye laws and forms
		Conceptualize the space, logistic and statutory constraints in the real world to draw an efficient plan so that optimization is achieved
		Attach and retrieve information pertaining to various civil engineering components through 3-D modelling software
		Demonstrate a virtual walkthrough of buildings.
11	Mini Project – 1A (CEM301)	Identify problems based on societal /research needs.
		Apply Knowledge and skill to solve societal problems in a group.
		Develop interpersonal skills to work as member of a group or leader.
		Draw the proper inferences from available results through theoretical/ experimental/simulations.
		Analyse the impact of solutions in societal and environmental context for sustainable development.
		Use standard norms of engineering practices and Excel in written and oral communication.
		Demonstrate capabilities of self-learning in a group, which leads to life long learning.
		Demonstrate project management principles during project work.

COURSE OUTCOMES (UG)

SEM-IV

SR.NO	SUBJECT	COURSE OUTCOMES
1	Engineering Mathematics – IV (CEC401)	Apply the concept of Vector calculus to evaluate line integrals,surface integrals using Green's theorem,Stoke's theorem & Gauss divergence theorem.
		Use the concepts of Complex Integration for evaluating integrals, computing residues & evaluate various contour integrals.
		Apply the concept of correlation , Regression & Curve fitting to engineering problems in data science
		Use the concepts of probability and expectation for getting the spread of the data & distribution of probabilities.
		Apply the concept of probaility distribution to engineering problems & testing of hypothesis using sampling theory.
		Apply the concepts of parametric & nonparametric tests for analyzing practical problems.

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2	Structural Analysis (CEC402)	Calculate axial forces in the Coplanar trusses by using Method of joints and method of sections and also calculate radial shear, normal thrust and bending moment in parabolic 3-Hinged arches.
		Draw Influence Line Diagrams for axial forces in trusses, Reactions, SF and B M in beams and find their values when rolling loads are passing over them.
		Evaluate rotation and displacement at a joint of frames and deflection at any joint of truss and will be able to compute static and kinematic indeterminacy of structure.
		Apply Flexibility methods and make use of Clapeyron's Theorem to analyze the indeterminate structures.
		Analyse the indeterminate structures such as beams & simple rigid jointed frames using direct stiffness method.
		Analyse the indeterminate structures using Moment Distribution as Stiffness method and make plastic analysis.
3	Surveying (CEC403)	To Understand the use of various surveying types and their applications on field.
		To explain different methods and their procedure for levelling.
		To Execute theodolite and work out different tasks associated with it.
		To Execute Total station and GPS work out different tasks associated with it.
		To Interpret area, volume and topography using surveying formulas and instruments.
		To identify the requirement of Types of curve as per topoghapy and execute the calculative parameter of it.
4	Building Materials & Concrete Technology (CEC404)	To develop and implement the conceptual knowledge of building materials in the construction industry.
		Assess the properties of building stones and their classifications. Understand the concept of various methods of manufacturing bricks and different types of concrete blocks.
		To expose students to various quality control aspects of civil engineering materials by performing different lab tests on materials.
		Identify the ingredients and properties of fresh and hardened concrete.
		To interpret and design concrete mix for various grades for various exposure conditions.
		To study the new technology for manufacturing, testing and quality of concrete.
5	Fluid Mechanics-II (CEC405)	Analyze flow through pipes, various losses through pipes, pipe network and power transmission through nozzle.
		Explain the concept of Laminar flow and velocity distribution through parallel plates and pipes.
		Explain the concept of Turbulent flow and velocity distribution in pipes.
		Describe boundary layer concept , boundary layer separation and flow around submerged bodies.
		Apply Moment of Momentum Principle.
		Explain the importance of dimensionless numbers, dimensional analysis and similarity behavior of model and prototype.
6	Structural Analysis (CEL401)	Calculate axial forces in the Coplanar trusses by using Method of joints and method of sections and also calculate radial shear, normal thrust and bending moment in parabolic 3- Hinged arches.
		Draw Influence Line Diagrams for axial forces in trusses, Reactions, SF and B M in beams and find their values when rolling loads are passing over them.
		Evaluate rotation and displacement at a joint of frames and deflection at any joint of truss and will be able to compute static and kinematic indeterminacy of structure.
		Analyse the indeterminate structures such as beams & simple rigid jointed frames using Flexibility methods and direct stiffness method.
7	Surveying (CEL402)	To understand the use of various surveying methods and their applications on field.
		To Handle various advanced instruments required for surveying.
		To Take linear and angular measurement in different conditions.
		To Record the various measurements in the field book during practical and projects.
		To Prepare the plans and sections required for civil engineering projects.
		To set out Horizontal curve and foundation plan on field.

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8	Building Material Concrete Technology (CEL403)	Test physical properties of cement.
		Test physical properties of fine and coarse aggregates.
		Test physical attributes and mechanical strength of burnt clay bricks used in the construction of structures.
		Evaluate the effect of water cement ratio on workability and strength of concrete.
		Evaluate the effects of admixtures on physical properties of concrete.
		Determine the durability and strength of existing concrete structures by basic non-destructive tests.
		Design the concrete mix.
9	Fluid Mechanics-II (CEL404)	Verify the Reynold's experiment.
		Estimate the viscosity of fluid.
		Calculate the losses in pipes.
		Assess the flow pattern and velocity distribution in pipe flow.
		learn the water hammer phenomenon through demonstration.
		learn the wind tunnel testing through demonstration.
10	Skill Based lab Course – II (CEL405)	Operate a Total Station and traverse the field.
		Perform various operations like computing height of a structure, computing area of plot, subdividing area, demarcating boundaries, etc. Using Total Station
		Set out foundation plan using Total Station.
		Compute the point, line and area features using Global Navigation Satellite System.
		Plot various existing features in a geographic area on a GIS platform.
		Add attribute and perform various statistical operations in GIS.
11	Mini Project – 1B (CEM401)	Identify problems based on societal /research needs.
		Apply Knowledge and skill to solve societal problems in a group.
		Develop interpersonal skills to work as member of a group or leader.
		Draw the proper inferences from available results through theoretical/ experimental/simulations.
		Analyse the impact of solutions in societal and environmental context for sustainable development.
		Use standard norms of engineering practices
		Excel in written and oral communication.
		Demonstrate capabilities of self-learning in a group, which leads to life long learning.
		Demonstrate project management principles during project work.

COURSE OUTCOMES(UG)

SEM-V

SR.NO	SUBJECT	COURSE OUTCOMES
1	Theory of Reinforced Concrete Structures (CE501)	Explain concept and problems on WSM And LSM.
		Apply various clauses specified in IS: 456-2000 for designing structural members with safety and economy.
		Understand the use of readymade design charts and curves from Special Publications of Bureau of Indian Standards.
		Analyze and design one way and two way slabs.
		Analyze and design columns subjected to combined axial and uni-axial as well as biaxial short and slender column.
		Analyze and design single and combined footings, slab beam type footing and strap footing subjected to axial load and moments.
2	Applied Hydraulics (CE502)	Describe impact of jet on stationary, moving, hinged and series of plates also solve the numerical based on forces acting on it.
		Distinguish various types of turbines, Characteristic curves and its components.
		Analyze Centrifugal pumps by incorporating velocity triangle diagrams.
		Know the working mechanism of various Hydraulic machines.
		Identify the hydraulic behaviour of open channel flow and design the most economical section of channels.
		Explain mathematical relationships for hydraulic jumps, surges, and critical, uniform, and gradually-varying flows.

3	Geotechnical Engineering-I (CEL503)	Explain the basic concepts of the physical and engineering properties of soil and derive the relationships among various unit weights & other parameters.
		Comprehend clay mineralogy and plasticity behavior of clay.
		Analyze grain size distribution of soil and classify the soil as per IS code.
		Evaluate the coefficient of permeability of different types of soils and draw the flow net diagram to estimate seepage discharge.
		Compute the effective stress and pore water pressure inside the soil mass under different geotechnical conditions.
		Evaluate the compaction parameters in laboratory and field as well as understand the necessity and methods of soil exploration.
4	Transportation Engineering (CE504)	Compare various modes of transportation and understand basic technical aspects of railways, airways and waterways.
		Understand different road plans, requirements of alignments and Design horizontal and vertical geometrical elements of highways.
		Carry out different traffic studies and analyze basic parameters of traffic engineering for efficient planning and control of traffic.
		Design the flexible and rigid pavement as per relevant IRC codes.
		Construct different types of pavements, use of soil stabilization and planning of highway drainage.
		Carry out structural and functional evaluation of pavement, identify the failures and design the overlay.
5	DLOC-I Building Services & Repairs (CEDLO5012)	Apply the knowledge of working & installation of mechanical utility services in buildings.
		Understand the electrical supply lines, materials, safety devices and illumination systems used in buildings.
		Investigate and learn operations and adopt appropriate materials in plumbing system & integrate the same into the building projects.
		Assess the structural health of the buildings & adopt repair strategy to the damaged structures.
		Implement the right methods and materials for repairing the concrete structures and also decide the sequence of operations.
		Create and understand proper documentation process and adopt practices for safety for protection of men and materials on the repair site.
6	DLOC- I Advance concrete Technology(CEDLO 5017)	To use the various concrete materials and demonstrate the fresh properties of concrete.
		To perform different testing methods of concrete.
		To describe the durability of concrete and apply the knowledge of durability in extreme weather concreting.
		To design the concrete mix for field application by different methods.
		To explain the various properties of special concrete.
		To discuss the quality of concrete and explain the acceptance criteria.
7	Theory of Reinforced Concrete Structures(CEL501)	Understand the fundamentals of WSM and LSM.
		Apply various clauses specified in IS: 456-2000 for designing structural members with safety and economy.
		Understand the use of readymade design charts and curves from Special Publicationsof Bureau of Indian Standards.
		Analyze and design various reinforced concrete elements such as beam, slab, column, footings using the concept of Limit State Method.
8	Applied Hydraulics (CEL502)	Evaluate the efficiencies and discuss the working of various pumps and turbines.
		Apply impulse momentum principle to hydraulic machine.
		Determine the rate of flow through open channel.
		Generate and evaluate Gradually varied flow (GVF) and Rapid varied Flow (RVF) in open channel flow.
		Compute the Chezy's Constant through tilting flume.
9	Geotechnical Engineering – I (CEL503)	Determine the physical and engineering properties of soil.
		Determine the plasticity characteristics of soil.
		Carry out sieve analysis of soil, plot grain size distribution curve and determine the IS classification of soil.
		Determine coefficient of permeability of soils.
		Determine the compaction characteristics of soils.
		Compute the field SPT 'N' value and prepare the bore log.

10	Transportation Engineering (CEL504)	Classify Bitumen on basis of Penetration and Viscosity grade.
		Select Bitumen as per suitability on basis of Softening point and Ductility value.
		Determine suitability of aggregate on basis of Impact value, Abrasion value and Crushing value.
		Differentiate Elongated and Flaky aggregates on basis of Shape test.
		Carry out Classified volume study at mid-block section of road.
		Plot speed profile curve (S-Curve) at mid-block section.
11	Professional Communication and Ethics (CEL505)	Discern and develop an effective style of writing important technical/business documents.
		Investigate possible resources and plan a successful job campaign.
		Understand the dynamics of professional communication in the form of group discussions, meetings, etc. required for career enhancement.
		Develop creative and impactful presentation skills.
		Analyze personal traits, interests, values, aptitudes and skills.
		Understand the importance of integrity and develop a personal code of ethics.
12	Mini Project -2A (CEM501)	Identify problems based on societal /research needs and formulate a solution strategy.
		Apply fundamentals to develop solutions to solve societal problems in a group.
		Analyze the specific need, formulate the problem and deduce the interdisciplinary approaches, software-based solutions and computer applications.
		Develop systematic flow chart, evaluate inter disciplinary practices, devices, available software, estimate and recommend possible solutions.
		Draw the proper inferences from available results through theoretical/ experimental/ simulations and assemble physical systems.
		Create devises or design a computer program or develop computer application.

COURSE OUTCOMES(UG)

SEM-VI

SR.NO	SUBJECT	COURSE OUTCOMES
1	Design & Drawing of Steel Structure(CEC601)	Use the knowledge of Limit State Design philosophy as applied to steel structures. IS 800 code clauses
		Design bolted and welded connections.
		Design members subjected to axial tension.
		Design compression members, Built-up columns and column bases.
		Design members subjected to bending moment, shear force etc.
		Estimate design loads as per IS 875 for roof truss and design the Steel roof truss.
2	Water Resources Engineering (CEC602)	Describe National water Policy, Calculate Crop water requirement and Classify various types and methods of irrigation.
		Estimate flood discharge and Runoff by traditional and modern usage tools for planning and management of water resources projects.
		Apply knowledge on ground water, well hydraulics to estimate the safe yield and ground water potential.
		Analyze and design gravity dams and earthen dams with spillways for sustainable development.
		Compare different silt theories related to irrigation channel and design the same.
		Classify and Explain various canal structures and suggest remedial measures for water.
3	Geotechnical Engineering-II (CEC603)	Evaluate the consolidation parameters for the soil.
		Calculate the shear strength parameters for the soil.
		Calculate the factors of safety of different types of slopes under various soil condition,analyze the stability of slopes.
		Calculate lateral earth pressure under various soil condition.
		Calculate bearing capacity of shallow foundations using theoretical and field methods.
		Calculate load carrying capacity of individual as well as group of pile foundation using theoretical and field methods and pile settlement.
4	Environmental Engineering (CEC604)	Analyse the quality of water and make outline of water Supply scheme.
		Design the various units of water treatment plant and apply the advanced, miscellaneous treatments whenever necessary.
		Build service connection of water supply from main and building drainage system at construction site along with rain water harvesting layout.
		Analyse and plan sewerage system along with test for sewer line.
		Design the units of sewage treatment plant. Also, able to apply the knowledge of low- cost treatment and stream sanitation.
		Understand air pollution, noise pollution and functional elements of solid waste management.

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5	DLOC- II Construction Equipment & Techniques (CEDLO6013)	Understand the use/applications of various conventional construction equipments and select the best out of them for a particular site requirement.
		Know modern methods/equipments used for underground as well as underwater tunnelling.
		Compare conventional and modern methods of formwork and get acquainted with techniques used on sites with restricted space.
		Understand the techniques involved and the equipments required thereof for laying of utility lines, bridge construction and installation of structural steel members.
		Gain knowledge about the setting up of different kinds of the power generating structures.
		Get acquainted with the equipments/ techniques for construction of transporting facilities.
6	Design and Drawing of Steel Structures (CEL601)	Calculate dead, live and wind loads on the structure.
		Analyze the structure by analytical/graphical method.
		Use steel table for selecting appropriate section.
		Design the members for various load combinations.
		Design the bolted and welded connection.
		Read and Prepare the detailed fabrication drawing and design report.
7	Water Resources Engineering (CEL602)	Classify various techniques of water distribution and compute water requirement of crops.
		Discuss in detail about hydrological process and interpret plotting of hydrographs.
		Apply their knowledge on well hydraulics and compute discharge from an aquifer.
		Classify and describe various hydraulic structures such as dams and carry out its analysis for structural stability.
		Compare different silt theories related to irrigation channel and design the same.
		Identify and classify different canal head works - its distribution system and canal structures.
8	Geotechnical Engineering-II (CEL603)	Determine consolidation parameters such as coefficient of compressibility, coefficient of volume change, coefficient of consolidation.
		Determine cohesion and angle of shearing resistance for various soil types.
		Determine the CBR value of soil for pavement design.
		Determine swelling pressure of soil.
		Understand the concept of stress distribution in soils due to vertically applied load.
		Solve design problems using geotechnical software.
9	Environmental Engineering (CEL604)	Impart the knowledge on quality or characteristic of water and wastewater sample.
		Interpret the required treatment for water and wastewater based on standards and norms.
		Impart the knowledge on quality of solid waste.
		Measure the concentration of particulate matters, dust and dispersed pollutants in air.
		Inspect the levels of noise and interpret the results.
		Explain problematic soils and their associated issues.
10	Skill Based Lab Course-III (CEL605)	To understand the functions involved various softwares related to civil engineering field.
		To perform different functions of the software related to analysing modelling and designing the structure, creation of database and its analysis.
		To describe and represent the data obtained from site, experimental work in various formats as per industrial requirements
		To import road geometric design into the software as well as relate with the design standards applied into the software.
		To apply the knowledge to create the programme in excel and various computer languages for solving problems pertaining to civil engineering field.
11	Mini Project -2B (CEM601)	Identify problems based on societal /research needs and formulate a solution strategy.
		Apply fundamentals to develop solutions to solve societal problems in a group.
		Analyze the specific need, formulate the problem and deduce the interdisciplinary approaches, software-based solutions and computer applications.
		Develop systematic flow chart, evaluate inter disciplinary practices, devices, available software, estimate and recommend possible solutions.
		Draw the proper inferences from available results through theoretical/experimental/simulations and assemble physical systems.
		Create devises or design a computer program or develop computer application.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-23

COURSE OUTCOMES (UG)

SEM-VII

SR.NO	SUBJECT	COURSE OUTCOMES
1	Design & Drawing of Reinforced Concrete Structure (CE-C701)	Design G+3 RCC framed building using IS code recommendations.
		Design different types of retaining walls with detailing of reinforcement.
		Design different types of water tanks with detailing of reinforcement.
		Apply the basic concepts of structural dynamics.
		Evaluate the response of structure during an earthquake and calculate design forces.
		Explain principles of Pre-stressed Concrete and its losses.
2	Quantity Survey, Estimation & Valuation (CE-C702)	Apply the measurement systems to various civil engineering items of work.
		Draft the specifications for various items of work & determine unit rates of items of works.
		Estimate approximate cost of the structures by using various methods & prepare detailed estimates of various civil engineering structures, including bar bending schedule, by referring drawings.
		Assess the quantities of earthwork & construct mass haul diagrams.
		Draft tender notice & demonstrate the significance of the tender as well as contract process.
		Determine the present fair value of any constructed building at stated time.
3	Department level Elective - III Advanced Construction Technology (CEDLO7015)	Evaluate the procedure of construction techniques for sub structure of major civil engineering projects.
		Get a thorough knowledge of various stages of construction of super structure of major civil engineering projects.
		Gain an experience in the implementation of new construction technology on engineering concepts which are applied in field Advanced construction technology in special structures.
		Get a diverse knowledge of the different methods of advancement in construction techniques and ground improvement techniques.
		Learn various dredging systems for major civil engineering projects.
		Explain the theoretical and practical aspects of rehabilitation and strengthening techniques in civil engineering along with the design and management applications.
4	Department Optional Course-4 Solid and Hazardous Waste Management (CEDLO7022)	Acquire the knowledge of functional elements of solid waste management.
		Illustrate solid waste collection system, route optimization techniques, transfer station and processing of solid waste.
		Develop the ability to plan waste minimization and processing of solid waste.
		Explain approaches to treat the solid waste in the most effective manner for sustainable development.
		Discuss safe methods of handling, management and disposal of hazardous waste.
		Summarize waste management techniques used for assorted solid waste
5	Institute level Elective - I Disaster Management and Mitigation Measures (ILOC7017)	Get to know natural as well as manmade disaster and their extent and possible effects on the economy.
		Plan of national importance structures based upon the previous history.
		Get acquainted with government policies, acts and various organizational structure associated with an emergency.
		Get to know the simple do's and don'ts in such extreme events and act accordingly.
6	Design and Drawing of Reinforced Concrete Structures (CEL701)	Design G+3 RCC framed building using IS code recommendations.
		Design different types of water tanks with detailing of reinforcement.
		Design different types of retaining walls with detailing of reinforcement
		Apply the basic concepts of structural dynamics
		Explain response of structure during an earthquake and calculate design forces.
		Explain principles of Prestressed Concrete and its losses.

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7	Quantity Survey, Estimation & Valuation (CEL702)	Identify current unit rates of various construction materials through market survey & also study District Schedule of Rates (DSR)
		Prepare rate analysis of few important Items of work
		Estimate approximate cost of the structures by using various methods & prepare detailed estimates of various civil engineering structures, including bar bending schedule, by referring drawings.
		Assess the quantities of earthwork & construct mass haul diagrams.
		Draft tender notice & demonstrate the significance of the tender as well as contract process.
		Evaluate present fair value of any constructed building at stated time.
8	Major Project Part-I (CEP701)	Review & comprehend literature in the selected domain
		Articulate problem statement & identify the objectives
		Identify existing methods or solutions to solve identified problem
		Identify modern engineering tools & other resources to solve the problem
		Formulate methodology to solve the identified problem
		Effectively communicate their project work by writing reports & presentations

COURSE OUTCOMES(UG)

SEM-VIII

SR.NO	SUBJECT	COURSE OUTCOMES
1	Design and Drawing of Reinforced Concrete Structures (CE-C801)	Understand the complete analysis and design of public building using relevant IS codes.
		Analyze and Design of different types of Staircase.
		Interpret the complete analysis and design different types of retaining wall by Limit state method.
		Design Different Types of water Tank.
		Explain response of structure during an earthquake and calculate design forces.
		Explain principle of PSC and calculate losses .
2	Construction Management (CE-C802)	To understand the mnanagement functions like planning, scheduling, executing & controlling the construction projects.
		Explain the roles and responibilities of various angencies involved in construction project.
		Apply the knowledge of management functions like planning, scheduling, executing and controlling to construction projects.
		Demonstrate their capability for preparing the project networks to work out best possible time for completing the project.
		Exercise the optimum time- cost relationship for construction projects.
		Implement the safety aspects during the execution of civil engineering project & quality aspects during the execution of civil engineering project.
3	Deptartment level Elective -IV Industrial Waste Treatment (CE-DLO8032)	Understand the characteristics of industrial wastewater.
		Identify sampling method and analyze industrial waste.
		Design facilities for the processing and reclamation of industrial waste water.
		Explain on-site treatment methods and solve Analyze and design wastewater treatment systems.
		Detailed on-site manufacturing processes and treatments of industrial waste water.
		Analyze proposed development project plans for possible environmental effects and to improve treated effluent quality to confirm standard prescribed by regulatory agencies.
4	Institute level Elective - II Environment Management (CE-ILO8048)	Identify environment, management, systems & organisations in relation to environmental management.
		Demonstrate an integrative approach to environmental issues with a focus on sustainability.
		Understand concepts of ecology.
		Understand corporate environmental responsibility & environment quality management.
		Identify the role of the IS 14000 series of standard in industry.
		General overview of major legislations of different types of environmental act
5	Major Project Part-II (CEP801)	Perform on analytical, experimental or numerical method to solve identified problem
		Produce alternative design solution to meet the functional requirements of the defined problem.
		Represent the data in Tabular or graphical forms so as to facilitate, analysis & explain of the data.
		Express Engineering principles & manage the finance required for the execution of the Project.
		Infer at results, conclusion with its validation, also propose the future scope of work on the identified problem.
		Communicate effectively their project work by writing reports and publishing technical papers based on entire project work.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-23

COURSE OUTCOMES(PG)

SEM-I

SR.NO	SUBJECT	COURSE OUTCOMES
1	Statistical Methods in Construction (CEMC101)	Apply probability theories to construction processes.
		Draw meaningful inferences from qualitative and quantitative data using measures of dispersion.
		Establish Correlation co-efficient between various civil engineering parameters.
		Develop linear regression equation between various civil engineering parameters.
		Apply mathematical models to construction processes/systems, so the maximum output from a particular input may be obtained.
		Simulate the performance of a particular system, based on past data/performance.
2	Project Management & Planning in Construction (CEMC102)	Apply the knowledge of management functions like planning, scheduling, executing & controlling the projects.
		Explain the project management life cycle and various phases from project initiation through closure.
		Demonstrate Time management of a project by proper scheduling using Networking Techniques.
		Select the best method of allocating resources to the projects by considering requirements & constraints associated with it.
		Elaborate the concept of updating & develop optimum relationship between time & cost.
		Illustrate the quality & safety measures to be adopted during the execution of Construction projects.
3	Program Elective I Contract Management (CEMPE1011)	Explain the basic procedure of bidding for construction projects.
		Demonstrate the all the types of contract along with their suitability in construction practices.
		Apply the knowledge of Indian Contract Act in construction Industry.
		Select appropriate method for resolving the disputes arisen.
		Demonstrate the important terms associated with Indian Contract Act.
		Acquire knowledge of various terms such as Bailment, Pledges, Indemnity & guarantee.
4	Program Elective 2: Resource Management (CEMPE1022)	Explain the requirements of resources for construction projects.
		Classify and code the procurement process of construction materials
		Describe the need of quality control of construction materials
		Compare construction equipment/s and their optimum use
		Estimate the need of recruitment of competent staff, their training and retention.
		Elaborate the roles and responsibilities of trade unions in industry
5	Institute Level Elective: Disaster Management and Mitigation Measures (CEMIE 1017)	Get to know natural as well as manmade disaster and their extent and possible effects on the economy.
		Plan of national importance structures based upon the previous history.
		Get acquainted with government policies, acts and various organizational structure associated with an emergency.
		Get to know the simple do's and don'ts in such extreme events and act accordingly.

COURSE OUTCOMES(PG))

SEM-II

SR.NO	SUBJECT	COURSE OUTCOMES
1	Project Economics and Financial Management (CEMC201)	Apply the basic principles of economics to construction entities.
		Prepare financial statements.
		Estimate the working capital required on a construction project.
		Plan finance w.r.t. cash and credit required.
		Perform capital budgeting and project portfolio analysis.

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2	Infrastructure Development (CEMC202)	Appraise and criticize various Indian construction and infrastructure projects for their financial successes or failures.
		Describe the role of infrastructure in overall development of the nation. Analyze global and Indian perspective and roles of various agencies involved in construction industry.
		Classify infrastructure projects and explain major achievements in infrastructure sector in India.
		Describe financing of infrastructure projects and various issues like GDP and its role, government policies & strategies, sources of financing infrastructure projects, FDI in construction industry.
		Explain the concept of public private partnership & its implementation in practice. compare various PPP models involved in construction industry and role of role and functions of PMC in infrastructure projects.
		Explain issues related to infrastructure development like environmental clearances. Role of FICCI.
3	Program Elective 3: Building Services and Repairs (CEMPE2012)	Describe the electrical system and lighting systems in buildings.
		Explain water distribution and drainage systems, piped gas supply systems, fire-fighting systems.
		Explain mechanical systems in buildings.
		Identify causes for deterioration of structures & evaluate them.
		Explain repair materials and techniques.
		Describe seismic retrofitting and maintenance of heritage structures.
4	Program Elective 4: Advanced Construction Technology (CEMPE2022)	Explain the procedure of construction techniques for sub structure of major civil engineering projects.
		Gain knowledge of various stages of construction of super structure of major civil engineering projects.
		Demonstrate the Implementation of new construction technology on engineering concepts which are applied in field Advanced construction technology in special structures.
		Illustrate the different methods of advancement in construction techniques and ground improvement techniques.
		Apply the theoretical and practical aspects of rehabilitation and strengthening techniques in civil engineering along with the design and management applications
		Describe various dredging systems for major civil engineering projects.
5	Institute Level Elective: Project Management (CEMIE 2021)	Apply selection criteria and select an appropriate project from different options.
		Write work break down structure for a project and develop a schedule based on it.
		Identify opportunities and threats to the project and decide an approach to deal with them strategically.
		Use Earned value technique and determine & predict status of the project.
		Capture lessons learned during project phases and document them for future reference

Head of Department

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DEPARTMENT OF COMPUTER ENGINEERING

ACADEMIC YEAR 22-23

YEAR: SE **SEM: III** **SCHEME: C**

SR. NO.	SUBJECT	COURSE OUTCOMES
1	Engineering Mathematics -III (CSC301)	Use the concept of Laplace transform and its application to solve the real integrals in engineering problems.
		Use the concept of inverse Laplace transform of various functions and its applications in engineering problems.
		Expand the periodic function by using the Fourier series for real-life problems and complex engineering problems.
		Use complex variable theory ,application of harmonic conjugate to get orthogonal trajectories and analytic functions.
		Apply the concept of Correlation and Regression to the engineering problems in data science, machine learning, and AI.
		Apply the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.
2	Discrete Structure and Graph Theory (CSC302)	Interpret the notion of mathematical thinking, mathematical proofs and apply them in problem solving.
		Describe to reason logically.
		Competency to use relations, functions,Diadraph and Lattics.
		Explore and apply concept of graph theory in solving real world problems.
		Interprete use of groups and codes in Encoding-Decoding.
		Analyze a complex computing problem and apply principles of discrete mathematics to identify solutions.
3	Data Structure (CSC303)	Implement Linear and Non-Linear data structures.
		Handle various operations like searching, insertion, deletion and traversals on various data structures.
		Explain various data structures, related terminologies and its types.
		Choose appropriate data structure and apply it to solve problems in various domains.
		Analyze and Implement appropriate searching techniques for a given problem.
		Demonstrate the ability to analyze, design, apply and use data structures to solve engineering problems and evaluate their solutions.
4	Digital Logic & Computer Organization and Architecture (CSC304)	Learn different number systems and basic structure of computer system.
		Demonstrate the arithmetic algorithms.
		Use the basic concepts of digital components and processor organization.
		Interpret the generation of control signals of computer.
		Demonstrate the memory organization.
		Describe the concepts of parallel processing and different Buses.
5	Computer Graphics (CSC305)	Describe the basic concepts of Computer Graphics.
		Demonstrate various algorithms for basic graphics primitives.
		Apply 2-D geometric transformations on graphical objects.
		Use various Clipping algorithms on graphical objects.
		Explore 3-D geometric transformations, curve representation techniques and projections methods.
		Explain visible surface detection techniques and Animation.
6	Data Structure Lab (CSL301)	Implement linear data structures & be able to handle operations like insertion, deletion, searching and traversing on them.
		Implement nonlinear data structures & be able to handle operations like insertion, deletion, searching and traversing on them.
		Choose appropriate data structure and apply it in various problems.
		Select appropriate searching techniques for given problems.
7	Digital Logic & Computer Organisationn and Architecture Lab	Interpret the basics of digital components.
		Design the basic building blocks of a computer: ALU, registers, CPU and memory
		Recognize the importance of digital systems in computer architecture
		Implement various algorithms for arithmetic operations.
8	Computer Graphics Lab (CSL303)	Implement various output and filled area primitive algorithms.
		Apply transformation, projection and clipping algorithms on graphical objects.
		Perform curve and fractal generation methods.
		Develop a Graphical application/Animation based on learned concept.
9	Skill base Lab course: Object Oriented Programming with Java (CSL304)	Apply fundamental programming constructs.
		Illustrate the concept of packages, classes and objects.
		Elaborate the concept of strings, arrays and vectors.
		Implement the concept of inheritance and interfaces.
		Implement the concept of exception handling and multithreading.
		Develop GUI based application.
10	Mini Project –1A (CSM301)	Identify problems based on societal /research needs.
		Apply Knowledge and skill to solve societal problems in a group.
		Develop interpersonal skills to work as member of a group or leader.
		Draw the proper inferences from available results through theoretical/ experimental/simulations.
		Analyze the impact of solutions in societal and environmental context for sustainable development.
		Use standard norms of engineering practices .
		Excel in written and oral communication.
		Demonstrate capabilities of self-learning in a group, which leads to lifelong learning.
		Demonstrate project management principles during project work.

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DEPARTMENT OF COMPUTER ENGINEERING

YEAR: SE **SEM: IV** **SCHEME: C**

SR.NO.	SUBJECT	COURSE OUTCOMES
1	Engineering Mathematics-IV (CSC401)	Apply the concepts of eigenvalues and eigenvectors in engineering problems.
		Use the concepts of Complex Integration for evaluating integrals, computing residues & evaluate various contour integrals.
		Apply the concept of Z- transformation and inverse in engineering problems.
		Use the concept of probability distribution and sampling theory to engineering problems.
		Apply the concept of Linear Programming Problems to optimization.
		Solve Non-Linear Programming Problems for optimization of engineering problems.
2	Analysis of Algorithms (CSC402)	Analyze the running time and space complexity of algorithms.
		Describe, apply and analyze the complexity of divide and conquer strategy.
		Describe, apply and analyze the complexity of greedy strategy.
		Describe, apply and analyze the complexity of dynamic programming strategy.
		Explain and apply backtracking, branch and bound.
		Explain and apply string matching techniques.
3	Database Management System (CSC403)	Recognize the need of database management system
		Design ER and EER diagram for real life applications
		Construct relational model and write relational algebra queries.
		Formulate SQL queries
		Apply the concept of normalization to relational database design.
		Describe the concept of transaction, concurrency and recovery.
4	Operating System (CSC404)	Interpret the objectives, functions and structure of OS
		Analyze the concept of process management and evaluate performance of processscheduling algorithms
		Interpret and apply the concepts of synchronization and deadlocks
		Evaluate performance of Memory allocation and replacement policies
		Interpret the concepts of file management.
		Apply concepts of I/O management and analyze techniques of disk scheduling.
5	Microprocessor (CSC405)	Describe core concepts of 8086 microprocessor.
		Interpret the instructions of 8086 and write assembly and Mixed language programs.
		Identify the specifications of peripheral chip.
		Design 8086 based system using memory and peripheral chips.
		Appraise the architecture of advanced processors
		Interpret hyperthreading technology
6	Analysis of Algorithms Lab (CSL401)	Implement the algorithms using different approaches.
		Analyze the complexities of various algorithms.
		Compare the complexity of the algorithms for specific problem.
7	Database Management System Lab (CSL402)	Design ER /EER diagram and convert to relational model for the realworld application.
		Apply DDL, DML, DCL and TCL commands
		Interpret simple and complex queries
		Use PL / SQL Constructs.
		Demonstrate the concept of concurrent transactions execution and frontend-backend connectivity
8	Operating System Lab (CSL403)	Demonstrate basic Operating system Commands, Shell scripts, System Calls and API wrt Linux
		Implement various process scheduling algorithms and evaluate their performance.
		Implement and analyze concepts of synchronization and deadlocks.
		Implement various Memory Management techniques and evaluate their performance.
		Implement and analyze concepts of virtual memory.
		Demonstrate and analyze concepts of file management and I/O management techniques.
9	Microprocessor Lab (CSL404)	Use appropriate instructions to program microprocessor to perform various task
		Develop the program in assembly/ mixed language for Intel 8086 processor
		Demonstrate the execution and debugging of assembly/ mixed language program
10	Skill base Lab course: Python Programing (CSL405)	Interpret basic concepts in python.
		Explore contents of files, directories and text processing with python
		Develop program for data structure using built in functions in python.
		Explore django web framework for developing python-based web application.
		Explore Multithreading concepts using python.

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DEPARTMENT OF COMPUTER ENGINEERING

11	Mini Project 1-B CSM401	Identify problems based on societal /research needs.
		Apply Knowledge and skill to solve societal problems in a group.
		Develop interpersonal skills to work as member of a group or leader.
		Draw the proper inferences from available results through theoretical/ experimental/simulations.
		Use standard norms of engineering practices .
		Excel in written and oral communication.
		Demonstrate capabilities of self-learning in a group, which leads to lifelong learning.
		Demonstrate project management principles during project work.

YEAR: TE **SEM:V** **SCHEME: C**

SR.NO.	SUBJECT	COURSE OUTCOMES
1	Theoretical Computer Science (CSC501)	Explore the concepts of Theoretical Computer Science, difference and equivalence of DFA and NFA, languages described by finite automata and regular expressions.
		Design Context free grammer, pushdown automata to recognize the language.
		Design Regular Expressions and Languages
		Design Regular and Context Free Grammar.
		Develop an understanding of computation through Turing Machine.
		Acquire fundamental understanding of decidability and undecidability.
2	Software Engineering (CSC502)	Identify requirements & assess the process models
		Plan, schedule and track the progress of the projects
		Design and develop the software projects
		Explore testing of software project
		Apply testing principles on software project and Analyze the maintenance concepts.
		Identify risks, manage the change to assure quality in software projects.
3	Computer Network (CSC503)	Demonstrate the concepts of data communication at physical layer and compare ISO - OSI model with TCP/IP model.
		Explore different design issues at data link layer
		Design the network using IP addressing and sub netting / supernetting schemes
		Analyze transport layer protocols and congestion control algorithms.
		Explore protocols at application layer
		Explore protocols at network layer
4	Data Warehousing and Mining (CSC504)	Demonstrate data warehouse fundamentals and design data warehouse with dimensional modelling and apply OLAP operations.
		Interpret data mining principles and perform Data preprocessing and Visualization.
		Identify appropriate data mining algorithms to solve real world problems
		Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining.
		Interpret Mining frequent patterns and associations rules.
		Describe complex information and social networks with respect to web mining.
5	Advance Database Management System (CSDLO5013)	Design distributed database using the various techniques for query processing.
		Measure query cost and perform distributed transaction management.
		Organize the data using XML and JSON database for better interoperability.
		Compare different types of NoSQL databases
		Formulate NoSQL queries using Mongodb.
		Describe various trends in advance databases through temporal, graph based and spatial based databases.
6	Software Engineering Lab (CSL501)	Identify requirements and apply software process model to selected case study
		Develop architectural models for the selected case study.
		Explore software testing process.
		Use computer-aided software engineering (CASE) tools.
7	Computer Network Lab (CSL502)	Design and setup networking environment in Linux.
		Use Network tools and simulators such as NS2, Wireshark etc. to explore networking algorithms and protocols.
		Implement programs using core programming APIs for understanding networking concepts.
		Interpret Network simulators.
8	Data Warehousing and Mining Lab (CSL503)	Design data warehouse and perform various OLAP operations.
		Implement data mining algorithms like classification.
		Implement clustering algorithms on a given set of data sample.
		Implement Association rule mining & web mining algorithm.
9	Business Communication & Ethics II (CSL504)	Plan and prepare effective business/ technical documents which will in turn provide solid foundation for their future managerial roles.
		Strategize their personal and professional skills to build a professional image and meet the demands of the industry.
		Emerge successful in group discussions, meetings and result-oriented agreeable solutions in group communication situations.
		Deliver persuasive and professional presentations.
		Develop creative thinking and interpersonal skills required for effective professional communication.
		Apply codes of ethical conduct, personal integrity and norms of organizational behaviour.

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10	Mini Project 2A (CSM501)	Identify societal/research/innovation/entrepreneurship problems through appropriate literature surveys.
		Identify Methodology for solving above problem and apply engineering knowledge and skills to solve it .
		Validate, Verify the results using test cases/benchmark data/theoretical/ inferences/experiments/simulations.
		Analyze and evaluate the impact of solution/product/research/innovation /entrepreneurship towards societal/environmental/sustainable development.
		Use standard norms of engineering practices and project management principles during project work .
		Communicate through technical report writing and oral presentation.
		Gain technical competency towards participation in Competitions, Hackathons, etc.
		Demonstrate capabilities of self-learning, leading to lifelong learning.
		Develop interpersonal skills to work as a member of a group or as leader

YEAR: TE **SEM: VI** **SCHEME: C**

SR.NO.	SUBJECT	COURSE OUTCOMES
1	System Programming and Compiler Construction (CSC601)	Generate machine code by implementing two pass assemblers.
		Implement Two pass macro processor
		Parse the given input string by constructing Top down/Bottom-up parser.
		Identify and Validate tokens for given high level language and Implement synthesis phase of compiler.
		Explore LEX & YACC tools.
		Generate Intermediate Code.
2	Cryptography & System Security (CSC602)	Apply the knowledge of symmetric and asymmetric cryptography to implement simple ciphers.
		Explore the different network reconnaissance tools to gather information about networks.
		Explore and use tools like sniffers, port scanners and other related tools for analysing packets in a Network
		Set up firewalls and intrusion detection systems using open-source technologies and to explore email security.
		Explore various attacks like buffer-overflow and web application attack.
		Explore Network Security protocols and Applications
3	Mobile Computing (CSC603)	Explore basic concepts and principles in computing, cellular architecture.
		Interpret the components and functioning of mobile networking.
		Explore variety of security techniques in mobile network.
		Explore IP and TCP protocols in mobile networking
		Apply the concepts of WLAN for local as well as remote applications.
		Explore Long Term Evolution (LTE) architecture and its interfaces.
4	Artificial Intelligence (CSC604)	Develop a basic understanding of AI building blocks presented in intelligent agents.
		Choose appropriate problem solving method and knowledge representation technique.
		Analyze the strength and weaknesses of AI approaches to knowledge– intensive problem solving.
		Interpret the design models for reasoning with uncertainty as well as the use of unreliable information.
		Design and develop AI applications in real world scenarios.
5	Internet of Things (CSDLO6011)	Explore the concepts of IoT and the Things in IoT.
		Emphasize core IoT functional Stack and understand application protocols for IoT.
		Apply IoT knowledge to key industries that IoT is revolutionizing
		Examines various IoT hardware items and software platforms used in projects.
6	System Programming and Compiler Construction Lab (CSL601)	Generate machine code by implementing two pass assemblers.
		Implement Two pass macro processor.
		Parse the given input string by constructing Top down/Bottom-up parser.
		Identify and Validate tokens for given high level language and Implement synthesis phase of compiler.
		Explore LEX & YACC tools.
7	Cryptography & System Security Lab (CSL602)	Apply the knowledge of symmetric and asymmetric cryptography to implement simple ciphers.
		Explore the different network reconnaissance tools to gather information about networks.
		Explore and use tools like sniffers, port scanners and other related tools for analysing packets in a Network.
		Set up firewalls and intrusion detection systems using open-source technologies and to explore email security.
		Explore various attacks like buffer-overflow and web application attack.
8	Mobile Computing Lab (CSL603)	Develop and demonstrate mobile applications using various tools.
		Articulate the knowledge of GSM, CDMA & Bluetooth technologies and demonstrate it.
		Explore simulation of frequency reuse, hidden/exposed terminal problem.
		Implement security algorithms for mobile communication network.
		Demonstrate simulation and compare the performance of Wireless LAN.
9	Artificial Intelligence Lab (CSL604)	Identify languages and technologies for Artificial Intelligence.
		Implement uninformed and informed searching techniques for real world problems.
		Create a knowledge base using any AI language.
		Design and implement expert systems for real world problems.

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10	Cloud Computing (CSL605)	Implement different types of virtualization techniques.
		Analyze various cloud computing service models and implement them to solve the given problems.
		Design and develop real world web applications and deploy them on commercial cloud(s).
		Explain major security issues in the cloud and mechanisms to address them.
		Explore various commercially available cloud services and recommend the appropriate one for the given application.
		Implement the concept of containerization.
11	Mini Project 2B(CSM601)	Identify societal/research/innovation/entrepreneurship problems through appropriate literature surveys.
		Identify Methodology for solving above problem and apply engineering knowledge and skills to solve it.
		Validate, Verify the results using test cases/benchmark data/theoretical/ inferences/ experiments/ simulations.
		Analyze and evaluate the impact of solution/product/research/innovation /entrepreneurship towards societal/environmental/sustainable development.
		Use standard norms of engineering practices and project management principles during project work.
		Communicate through technical report writing and oral presentation.
		Gain technical competency towards participation in Competitions, Hackathons, etc.
		Demonstrate capabilities of self-learning, leading to lifelong learning.
		Develop interpersonal skills to work as a member of a group or as leader.

YEAR: BE **SEM: VII** **SCHEME:C**

SR.NO.	SUBJECT	COURSE OUTCOMES
1	Machine Learning (CSC701)	Acquire fundamental knowledge of developing machine learning models.
		Select, apply and evaluate an appropriate machine learning model for the given
		Demonstrate ensemble techniques to combine predictions from different models.
		Demonstrate the dimensionality reduction techniques.
2	Big Data Analysis (CSC702)	Interpret the building blocks of Big Data Analytics.
		Apply fundamental enabling techniques like Hadoop and MapReduce in solving real world problem.
		Analyze different NoSQL systems and how it handles big data.
		Apply advanced techniques for emerging applications like stream analytics.
		Achieve adequate perspectives of big data analytics in various applications like recommender systems, social media applications.
		Apply statistical computing techniques and graphics for analyzing big data.
3	Natural Language Processing (CSDC7013)	Describe the field of natural language processing.
		Design language model for word level analysis for text processing.
		Design various POS tagging techniques and parsers.
		Design, implement and test algorithms for semantic and pragmatic analysis.
		Formulate the discourse segmentation and anaphora resolution.
		Apply NLP techniques to design real world NLP applications.
4	Blockchain (CSDC7022)	Explain blockchain concepts.
		Apply cryptographic hash required for blockchain.
		Apply the concepts of smart contracts for an application.
		Design a public blockchain using Ethereum.
		Design a private blockchain using Hyperledger.
		Use different types of tools for blockchain applications.
5	Cyber Security and Laws (ILO7016)	Analyze the concept of cybercrime and its effect on outside world.
		Interpret and apply IT law in various legal issues.
		Distinguish different aspects of cyber law.
		Apply Information Security Standards compliance during software design and development.
6	Machine Learning Lab (CSL70011)	Implement an appropriate machine learning model for the given application.
		Implement ensemble techniques to combine predictions from different models.
		Implement the dimensionality reduction techniques.
7	Big Data Analytics Lab(CSL7012)	Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.
		Implement algorithms that uses Map Reduce to apply on structured and unstructured data.
		Perform hands-on NoSql databases such as Cassandra, HadoopHbase, MongoDB, etc
		Implement various data streams algorithms.
		Develop and analyze the social network graphs with data visualization techniques.
8	Natural Language processing Lab (CSDL7013)	Apply various text processing techniques.
		Design language model for word level analysis.
		Model linguistic phenomena with formal grammar.
		Design, implement and analyze NLP algorithms.
		Apply NLP techniques to design real world NLP applications such as machine translation,sentiment analysis, text summarization, information extraction, Question Answering system etc.
		Implement proper experimental methodology for training and evaluating empirical NLP system.
9	Blockchain Lab (CSDL7022)	Creating Cryptographic hash using merkle tree.
		Design Smart Contract using Solidity.
		Implementing ethereum blockchain using Geth.
		Demonstrate the concept of blockchain in real world application.

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DEPARTMENT OF COMPUTER ENGINEERING

YEAR: BE **SEM: VIII** **SCHEME:C**

SR.NO.	SUBJECT	COURSE OUTCOMES
1	Distributed Computing (CSC801)	Demonstrate knowledge of the basic elements and concepts related to distributed system technology.
		Illustrate the middleware technologies that support distributed applications such as RPC, RMI and Object based middleware.
		Analyze the various techniques used for clock synchronization and mutual exclusion ,deadlock.
		Demonstrate the concepts of Resource and Process management and synchronization algorithms.
		Demonstrate the concepts of Consistency and Replication Management.
		Apply the knowledge of Distributed File System to analyze various file systems like NFS, AFS and the experience in building large-scale distributed applications.
2	Digital Forensics (CSDC8012)	Discuss the phases of Digital Forensics and methodology to handle the computer security incident.
		Describe the process of collection, analysis and recovery of the digital evidence.
		Explore various tools to analyze malwares and acquired images of RAM/hard drive.
		Acquire adequate perspectives of digital forensic investigation in mobile devices
		Analyze the source and content authentication of emails and browsers.
		Produce unambiguous investigation reports which offer valid conclusions.
3	High Performance Computing (CSDC8022)	Analyze parallel and pipeline processing approaches.
		Design a parallel algorithm to solve computational problems and identify issues in parallel programming.
		Analyze the performance of parallel computing systems for clusters in terms of execution time, total parallel overhead, speedup.
		Develop efficient and high-performance parallel algorithms using OpenMP and message passing paradigm.
		Develop high-performance parallel programming using OpenCL and CUDA framework.
		Perform the range of activities associated with High Performance Computing in Cloud Computing.
4	Environmental Management (ILO8029)	Analyze the concept of environmental management.
		Analyze ecosystem and interdependence, food chain etc.
		Analyze and interpret environment related legislations.
5	Distributed Computing Lab (CSL801)	Develop, test and debug RPC/RMI based client-server programs.
		Implement techniques for clock synchronization.
		Implement techniques for Election Algorithms.
		Demonstrate mutual exclusion algorithms and deadlock handling.
		Implement techniques of resource and process management.
		Describe the concepts of distributed File Systems with some case studies.
6	Digital Forensics Lab (CSDL8022)	Explore various forensics tools and use them to acquire, duplicate and analyze data and recover deleted data.
		Implement penetration testing using forensics tools.
		Explore various forensics tools and use them to acquire and analyze live and static data.
		Verification of source and content authentication of emails and browsers.
		Demonstrate Timeline Report Analysis using forensics tools.
		Discuss real time crime forensics investigations scenarios.
7	High Performance Computing Lab (CSDL8022)	Perform Linux based commands on remote machine.
		Compare the performance of sequential algorithms with parallel algorithm in terms of execution time, speedup and throughput.
		Implement parallel program using OpenMP libraryand analyze its performance.
		Implement parallel program using MPIplatform and analyze its performance.
		Implement parallel program using OpenCL framework and analyze its performance.
		Implement parallel program using CUDA framework and analyze its performance.

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DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2022-23

YEAR: SE **SEM: III** **SCHEME: C (R-19)**

COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Engineering Mathematics-III (MEC301)	Apply the concept of Laplace transform to solve the real integrals in engineering problems.
		Apply the concept of inverse Laplace transform of various functions in engineering problems.
		Expand the periodic function by using Fourier series for real life problems and complex engineering problems.
		Find orthogonal trajectories and analytic function by using basic concepts of complex variable theory.
		Apply Matrix algebra to solve the engineering problems.
		Solve Partial differential equations by applying numerical solution and analytical methods for one dimensional heat and wave equations
2	Strength of Materials (MEC302)	Demonstrate fundamental knowledge about various types of loading and stresses induced.
		Draw the SFD and BMD for different types of loads and support conditions.
		Analyze the bending and shear stresses induced in beam.
		Analyze the deflection in beams and stresses in shaft.
		Analyze the stresses and deflection in beams and estimate the strain energy in mechanical elements
		Analyze buckling phenomenon in columns.
3	Production Processes (MEC303)	Demonstrate an understanding of casting process
		Illustrate principles of forming processes.
		Demonstrate applications of various types of welding processes.
		Illustrate the concept of producing polymer components and ceramic components.
		Illustrate principles and working of non-traditional manufacturing
		Understand the manufacturing technologies enabling Industry 4.0
4	Materials and Metallurgy (MEC304)	Identify the various classes of materials and comprehend their properties
		Apply phase diagram concepts to engineering applications
		Apply particular heat treatment for required property development
		Identify the probable mode of failure in materials and suggest measures to prevent them
		Choose or develop new materials for better performance
		Decide an appropriate method to evaluate different components in service

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5	Thermodynamics (MEC305)	Demonstrate application of the laws of thermodynamics to a wide range of systems.
		Compute heat and work interactions in thermodynamic systems
		Demonstrate the interrelations between thermodynamic functions to solve practical problems.
		Compute thermodynamic interactions using the steam table and Mollier chart
		Compute efficiencies of heat engines, power cycles.
		Apply the fundamentals of compressible fluid flow to the relevant systems
6	Materials Testing (MEL301)	Prepare metallic samples for studying its microstructure following the appropriate procedure.
		Identify effects of heat treatment on microstructure of medium carbon steel and hardenability of steel using Jominy end Quench test
		Perform Fatigue Test and draw S-N curve
		Perform Tension test to Analyze the stress - strain behavior of materials
		Measure torsional strength, hardness and impact resistance of the material
		Perform flexural test with central and three-point loading conditions
7	Machine Shop Practice (MEL302)	Know the specifications, controls and safety measures related to machines and machining operations.
		Use the machines for making various engineering jobs.
		Perform various machining operations
		Perform Tool Grinding
		Perform welding operations
8	Skill Based Lab: CAD – Modeling (MESBL301)	Illustrate basic understanding of types of CAD model creation.
		Visualize and prepare 2D modeling of a given object using modeling software.
		Build solid model of a given object using 3D modeling software.
		Visualize and develop the surface model of a given object using modeling software.
		Generate assembly models of given objects using assembly tools of a modeling software
		Perform product data exchange among CAD systems.
9	Mini Project - 1A (MEPBL301)	Identify problems based on societal /research needs.
		Apply Knowledge and skill to solve societal problems in a group.
		Develop interpersonal skills to work as member of a group or leader.
		Demonstrate capabilities of self-learning in a group, which leads to life long learning
		Analyze the impact of solutions in societal and environmental context for sustainable development.
		Demonstrate project management principles during project work.

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DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2022-23

YEAR: SE **SEM: IV** **SCHEME: C (R-19)**

COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Engineering Mathematics-IV (MEC401)	Apply the concept of Vector calculus to evaluate line integrals, surface integrals using Green's theorem, Stoke's theorem & Gauss Divergence theorem.
		Use the concepts of Complex Integration for evaluating integrals, computing residues & evaluate various contour integrals.
		Apply the concept of Correlation, Regression and curve fitting to the engineering problems in data science
		Illustrate understanding of the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.
		Apply the concept of probability distribution to engineering problems & testing hypothesis of small samples using sampling theory.
		Apply the concepts of parametric and nonparametric tests for analyzing practical problems.
2	Fluid Mechanics (MEC402)	Define properties of fluids, classify fluids and evaluate hydrostatic forces on various surfaces.
		Illustrate understanding of dimensional analysis of Thermal and Fluid systems.
		Differentiate velocity potential function and stream function and solve for velocity and acceleration of a fluid at a given location in a fluid flow.
		Formulate and solve equations of the control volume for fluid flow systems and Apply Bernoulli's equation to various flow measuring devices.
		Calculate pressure drop in laminar and turbulent flow, evaluate major and minor losses in pipes.
		Calculate resistance to flow of incompressible fluids through closed conduits and over surfaces.
3	Kinematics of Machinery (MEC403)	Identify various components of mechanisms
		Develop mechanisms to provide specific motion
		Draw velocity and acceleration diagrams of various mechanisms
		Choose a cam profile for the specific follower motion
		Predict condition for maximum power transmission in the case of a belt drive
		Illustrate requirements for an interference-free gear pair
4	CAD/CAM (MEC404)	Identify suitable computer graphics techniques for 3D modeling.
		Transform, manipulate objects & store and manage data.
		Develop 3D model using various types of available biomedical data.
		Create the CAM Toolpath for specific given operations.
		Build and create data for 3D printing of any given object using rapid prototyping and tooling processes.

		Illustrate understanding of various cost-effective alternatives for manufacturing products.
5	Industrial Electronics (MEC404)	Illustrate construction, working principles and applications of power electronic switches.
		Identify rectifiers and inverters for dc and ac motor speed control.
		Develop circuits using OPAMP and Timer IC 555.
		Identify digital circuits for industrial applications.
		Demonstrate the knowledge of basic functioning of microcontrollers.
		Analyze speed-torque characteristics of electrical machines for speed control.
6	Python Programming (MEL403)	Demonstrate understand of basic concepts of python programming.
		Identify, install and utilize python packages
		Develop and execute python programs for specific applications.
		Develop and build python program to solve real-world engineering problems
		Prepare a report on case studies selected
7	Skill based Lab: CNC and 3-D Printing (MESBL401)	Develop and execute part programing for any given specific operation.
		Build any given object using various CNC operations.
		Demonstrate CAM Tool path and prepare NC- G code.
		Develop 3D model using available biomedical data
		Build any given real life object using 3D printing process.
		Convert 2D images into 3D model
8	Mini Project - 1B (MEPBL 401)	Identify problems based on societal /research needs.
		Apply Knowledge and skill to solve societal problems in a group.
		Develop interpersonal skills to work as member of a group or leader
		Use standard norms of engineering practices
		Demonstrate capabilities of self-learning in a group, which leads to life long learning.
		Demonstrate project management principles during project work.

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DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2022-23

YEAR: TE **SEM: V** **SCHEME: C (R-19)**

COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Mechanical Measurements and Controls (MEC501)	Handle, operate and apply the precision measuring instruments / equipment's.
		Analyze simple machined components for dimensional stability & functionality.
		Classify various types of static characteristics and types of errors occurring in the system.
		Classify and select proper measuring instrument for displacement, pressure, flow and temperature measurements.
		Design mathematical model of system/process for standard input responses and analyze error and differentiate various types of control systems and time domain specifications
		Analyze the problems associated with stability.
2	Thermal Engineering (MEC502)	Analyze the three modes of heat transfer in engineering application.
		Develop mathematical models for different modes of heat transfer.
		Analyze performance parameters of different types of heat exchangers.
		Identify and analyze the Transient heat Transfer in engineering applications.
		Explain construction and working of different components of internal combustion engines.
		Evaluate engine performance and emission characteristics.
3	Dynamics of Machinery (MEC503)	Demonstrate working Principles of different types of governors and Gyroscopic effects on the mechanical systems
		Illustrate basic of static and dynamic forces
		Determine natural frequency of element/system
		Determine vibration response of mechanical elements / systems
		Design vibration isolation system for a specific application
		Demonstrate basic concepts of balancing of forces and couples
4	Finite Element Analysis (MEC504)	Solve differential equations using weighted residual methods.
		Develop the finite element equations to model engineering problems governed by second order differential equations.
		Apply the basic finite element formulation techniques to solve engineering problems by using one dimensional element.
		Apply the basic finite element formulation techniques to solve engineering problems by using two dimensional elements.
		Apply the basic finite element formulation techniques to find natural frequency of single degree of vibration system.
		Use commercial FEA software, to solve problems related to mechanical engineering.

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ACADEMIC YEAR 2022-23

SR.NO	SUBJECT	COURSE OUTCOMES
5	Optimization Techniques (MEDLO5011)	Identify the types of optimization problems and apply the calculus method to single variable problems.
		Formulate the problem as Linear Programming problem and analyze the sensitivity of a decision variable.
		Apply various linear and non-linear techniques for problem solving in various domain.
		Apply multi-objective decision making methods for problem in manufacturing environment and other domain.
		Apply multi criterion decision making methods for problem in manufacturing environment and other domain.
		Apply Design of Experiments method for Optimization
6	Professional communication and ethics-II (MESBL501)	Plan and prepare effective business/ technical documents which will in turn provide solid foundation for their future managerial roles.
		Strategize their personal and professional skills to build a professional image and meet the demands of the industry.
		Emerge successful in group discussions, meetings and result-oriented agreeable solutions in group communication situations.
		Deliver persuasive and professional presentations.
		Develop creative thinking and interpersonal skills required for effective professional communication.
		Apply codes of ethical conduct, personal integrity and norms of organizational behavior.
7	Mini Project – 2 A (MEPBL501)	Identify problems based on societal /research needs.
		Apply Knowledge and skill to solve societal problems in a group.
		Develop interpersonal skills to work as member of a group or leader.
		Draw the proper inferences from available results through theoretical/experimental/simulations.
		Analyze the impact of solutions in societal and environmental context for sustainable development.
		Use standard norms of engineering practices
		Demonstrate capabilities of self-learning in a group, which leads to life long learning.
		9. Demonstrate project management principles during project work.
		Excel in written and oral communication.

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DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2022-23

YEAR: TE **SEM: VI** **SCHEME: C (R-19)**

COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Machine Design (MEC601)	Use design data book/standard codes to standardize the designed dimensions
		Design Knuckle Joint, cotter joint and Screw Jack
		Design shaft under various conditions and couplings
		Select bearings for a given applications from the manufacturers catalogue.
		Select and/or design belts and flywheel for given applications
		Design springs, clutches and brakes
2	Turbo Machinery (MEC602)	Define various parameters associated with steam generators and turbo machines.
		Identify various components and mountings of steam generators with their significance.
		Identify various turbo machines and explain their significance.
		Apply principles of thermodynamics and fluid mechanics to estimate various parameters like mass flow rate power, torque, efficiency, temperature, etc.
		Evaluate performance of SG and Turbo machines and apply various techniques to enhance performance.
		Evaluate various phenomena related to performance like cavitation, choking, surging.
3	Heating, Ventilation, Air and Refrigeration (MEC603)	Illustrate the fundamental principles and applications of refrigeration and air conditioning systems.
		Identify various HVAC&R components
		Evaluate performance of various refrigeration system
		Estimate cooling and heating loads for an air conditioning system.
		Select air handling unit & design air distribution system
		Apply the knowledge of HVAC for the sustainable development of refrigeration and air conditioning systems.
4	Automation and Artificial Intelligence (MEC604)	Demonstrate understanding of fundamentals of industrial automation and AI.
		Design & develop pneumatic / hydraulic circuits.
		Design and develop electropneumatic circuits and PLC ladder logics.
		Demonstrate understanding of robotic control systems and their applications.
		Demonstrate understanding of various AI and machine learning technologies.
5	Press Tool Design (MEDLO6021)	Demonstrate various press working operations for mass production of sheet metal parts
		Identify press tool requirements to build concepts pertaining to design of press tools
		Prepare working drawings and setup for economic production of sheet metal components
		Select suitable materials for different elements of press tools
		Illustrate the principles and blank development in bent & drawn components

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		understand safety aspects and automation in press working
6	Measurements and Automation (MESBL601)	Apply inspection gauge to check or measure surface parameters.
		Measure surface parameters using precision measurement tools and equipment.
		Measure different mechanical parameters by using sensors.
		Analyze the response of a control systems.
		Demonstrate use of automated controls using pneumatic and hydraulic systems.
		Implement program on PLC system and demonstrate its application
7	Mini Project - 2B(MEPBL601)	Identify problems based on societal /research needs.
		Apply Knowledge and skill to solve societal problems in a group.
		Develop interpersonal skills to work as member of a group or leader.
		Draw the proper inferences from available results through theoretical/experimental/simulations.
		Analyze the impact of solutions in societal and environmental context for sustainable development.
		Use standard norms of engineering practices
		Excel in written and oral communication.
		Demonstrate capabilities of self-learning in a group, which leads to life long learning.
		Demonstrate project management principles during project work.

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DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2021-22

YEAR: BE **SEM: VII** **SCHEME: CBCGS**

Learner will be able to **COURSE OUTCOMES**

SR.NO	SUBJECT	COURSE OUTCOMES
1	Machine Design -II MEC701	Design of spur, helical, bevel and worm Gears.
		Design of rolling contact bearings.
		Design of hydro dynamically lubricated bearings.
		Design of cam and roller follower.
		Design and selection of Belts.
2	CAD/CAM/CAE MEC702	Identify proper computer graphics techniques for geometric modeling.
		Explain the 2-D Transform, manipulate objects and store and manage data.
		Plan part programming applicable to CNC machines.
		Discuss rapid prototyping and tooling concepts in any real-life applications.
		Identify the tools for Analysis of a complex engineering component.
		Explain transform manipulate objects store and manage data.
3	Automobile Engineering MEDLO7032	Compare Transmission systems, Live axle and differential.
		Discuss the Necessity of Brakes, Steering and Front axles.
		Discuss the Necessity of Suspension, Wheels and Tyres.
		Demonstrate the Electrical system.
		Analyze the forces concerned with Body Engineering.
		Discuss & compare the recent trends in Automobiles.
4	Production Planning and Control MEC703	Illustrate production planning functions and manage manufacturing functions in a better way.
		Develop competency in scheduling and sequencing of manufacturing operations.
		Discuss the inventory model, demand of the product and prepare an aggregate plan.
		Develop the skills of Inventory Management and cost effectiveness.
		Create a logical approach to Line Balancing in various production systems.
		Build techniques of manufacturing planning and control.
5	Product Lifecycle Management ILO7011	Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation.
		Illustrate various approaches and techniques for designing and developing products.
		Apply product engineering guidelines / thumb rules in designing products for moulding, machining, sheet metal working etc.
		Acquire knowledge in applying virtual product development tools for components, machining and manufacturing plant

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DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2021-22

YEAR: BE **SEM: VIII** **SCHEME: CBCGS**

Learner will be able to **COURSE OUTCOMES**

SR.NO	SUBJECT	COURSE OUTCOMES
1	Design of Mechanical Systems MEC801	Apply the concept of system design.
		Design of hoisting mechanism of EOT crane.
		Design belt conveyor systems.
		Design pumps for the given applications.
		Design engine components such as cylinder, piston, connecting rod and crankshaft.
		Design of machine tool gearbox.
2	Power Engineering MEC803	Compute heat interactions in combustion of reactive mixtures
		Differentiate boilers, boiler mountings and accessories
		Calculate boiler efficiency and assess boiler performance
		Demonstrate working cycles of gas turbines
		Draw velocity triangles of impulse/reaction turbines and calculate performance parameters/efficiency
		Demonstrate basic working of pumps
3	Power Plant Engineering MEDLO8041	List various equipment/systems utilized in power plants.
		Demonstrate site selection methodology, construction and operation of Hydro Electric Power Plants.
		Discuss working, site selection, advantages, disadvantages of steam power plants.
		Discuss operation of Combined Cycle Power Plants.
		Discuss types of reactors, waste disposal issues in nuclear power plants.
		Illustrate power plant economics.
4	Industrial Engineering and Management MEC802	Illustrate need for optimization of resource and its significance in manufacturing industries.
		Develop capability in integrating knowledge of design along with other aspects of value addition in the conceptualization and manufacturing stage of various products. .
		Demonstrate the concept of value analysis and its relevance.
		Explain different concepts involved in methods study.
		Classify different aspects of work system design and facilities design pertinent to manufacturing industries.
		Explain Agile manufacturing, flexible manufacturing and lean Manufacturing

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SR.NO	SUBJECT	COURSE OUTCOMES
5	Environmental Management ILO8029	Identify environment, management, systems & organizations in relation to environmental management.
		Demonstrate an integrative approach to environmental issues with a focus on sustainability.
		Understand concepts of ecology
		Understand corporate environmental responsibility & environment quality management.
		Identify the role of the IS 14000 series of standard in industry.
		General overview of major legislations of different types of environmental act
6	Renewable Energy Sources MEDLO8043	Define the need of different renewable energy sources
		Illustrate importance of renewable energy sources
		Explain various renewable energy sources in Indian context
		Simply and find utilization of solar and wind energy
		Analyze the design of bio gas
		Explain basics of hydrogen energy

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DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2021-22

YEAR: ME **SEM: I** **SCHEME: CBCGS**

COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Energy scenario, policy and environment (ESMC101)	Define the role of energy in global economic development.
		Analyze energy consumption pattern in India and its effect on economic development.
		Determine impact of international energy policy on national energy growth.
		discuss the Indian and International energy policies.
		Analyze Industrial Energy and environment.
		Explain relationship between energy, ecology and environment.
2	Energy efficiency in thermal system (ESMC102)	Define the reasons of incomplete combustion and attempt to reduce the subsequent impact.
		Discuss the ENCON opportunities and Furnace.
		Discuss the ENCON opportunities and Boilers.
		Measure performance evaluation of cogeneration.
		Determine ENCON opportunities in thermal systems.
		Measure and improve the quality of recovered waste energy.
3	Conventional power plant (ESMC103)	Distinguish between energy & power and understand power plant cycles in detail.
		Explain steam systems and steam power plant installation, operation, maintenance, and life cycle economics.
		What are Hydrometric power plants site selection and elements.
		Illustrate Gas Turbine power plants site selection and elements.
		Illustrate nuclear power plant installation, operation, maintenance, and life cycle economics.
		Define the advantages and disadvantages of combined operation of power plants.
4	Utilization of solar energy (ESMDLO1011)	Estimate and quantify available solar radiation.
		Discuss simulation of solar processes.
		Explain the Solar Photovoltaic cells.
		Identify and describe the basic principles and methodologies of solar systems.
		Design the solar energy collection system.
		Discuss the basic economics of solar energy systems.

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DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2021-22

SR.NO	SUBJECT	COURSE OUTCOMES
5	Energy audit and management (ILO1018)	Identify and describe present state of energy security and its importance.
		describe the basic principles and methodologies adopted in energy audit of an utility.
		Define energy audit principles.
		Discuss the energy performance evaluation of some common electrical installations and identify the energy saving opportunities.
		Explain the energy performance evaluation of some common thermal installations and identify the energy saving opportunities.
		Explain the energy performance evaluation of some common thermal installations and identify the energy saving opportunities.

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DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR 2021-22

YEAR: ME **SEM: II** **SCHEME: CBCGS**

COURSE OUTCOMES

Learner will be able to

SR.NO	SUBJECT	COURSE OUTCOMES
1	Advances in energy audit and management (ESMC201)	Distinguish between energy auditing stages & detailed energy auditing procedure.
		Explain Energy Auditing in PAT Cycle Explain the Roles of Energy manager and Energy audit.
		Discuss the Monitor and setting target in energy consumption.
		Discuss the framework of PAT cycle and understand M&V audit.
		Discuss the framework of PAT cycle and understand M&V audit.
		Discuss the commercial energy audits.
2	Energy efficiency in electrical systems (ESMC202)	Evaluate losses in electrical and power systems and improve its energy efficiency.
		Determine ENCON opportunities in Fan, Blowers and Compressors.
		Determine ENCON opportunities in HVAC Systems.
		Determine ENCON opportunities in electrical motor systems.
		Determine ENCON opportunities in fluids handling systems.
		Determine ENCON opportunities in lighting systems.
3	Renewable and sustainable energy systems (ESMC203)	Discuss sustainability initiatives for reducing energy impacts on environment.
		Explain the solar energy Technology.
		Explain the Wind power Technology.
		Discuss the role of renewable energy in climate change.
		Determine the efficient solar and wind energy technology.
		Discuss the current trends in sustainable and renewable energy.
4	Fuels combustion and emission control (ESMDLO2022)	Distinguish between conventional, non-conventional and nuclear fuels.
		Explain the types and production process of fuels.
		Determine the requirements for complete combustion process.
		List the Emission control methods.
		Analyze the effects of emission control.
		Discuss the combustion of fuels.
5	Research methodology (ESMDLO2022)	Explain a preliminary research design for projects in their subject matter areas.
		Explain the accurately collect, analyze and report data.
		Explain the IPR .
		Analyze research findings.
		List the various Research techniques for research data collection.
		Discuss present complex data or situations clearly.

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DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING

ACADEMIC YEAR 2022-23

COURSE OUTCOMES

YEAR: SE **SEM: III** **SCHEME:C-SCHEME**

SR.NO	SUBJECT	COURSE OUTCOMES
1	ENGINEERING MATHEMATICS-III (ECC301)	Apply the concept of Laplace Transforms to solve real integrals in Engineering problems.
		Apply the concept of Inverse Laplace Transforms to various functions in Engineering problems.
		Express the periodic function by using Fourier series for real life problems and complex engineering problems.
		Apply complex variable theory to find harmonic conjugate,orthogonal trajectories & analytic function.
		Use Matrix algebra to solve engineering problems.
		Apply the concept of vector calculus in real life problems.
2	ELECTRONIC DEVICES AND CIRCUITS (ECC302)	Explain functionality and applications of various electronic devices.
		Explain working of various electronics devices with the help of V-I characteristics.
		Derive expressions for performance parameters of BJT and MOSFET circutes.
		Evaluate performance of Electronic circuits (BJT and MOSFET based).
		Select appropriate circuit for given application.
		Design electronic circuit (BJT, MOSFET based) circuits for given specifications.
3	DIGITAL SYSTEM AND DESIGN (ECC303)	Explain number systems and digital codes and conversions.
		Describe types of digital logic, logic gates and logic families.
		Analyse, design and implement combinational logic circuits.
		Analyse, design and implement sequential logic circuits.
		Classify different types of memories and PLDs.
		Analyze and implement basic combinational and sequential circuits using VHDL/Verilog.
4	NETWORKS THEORY (ECC304)	Apply their knowledge in analyzing Circuits by using network theorems.
		Evaluate circuit using graph theory.
		Apply the time and frequency method of analysis.
		Apply network topology for analyzing the circuit.
		Solve the various parameters of two port network.
		Synthesize the network using passive elements.
5	ELECTRONIC INSTRUMENTS AND CONTROL (ECC305)	Discuss basic Concept of Instruments and Measure various parameters.
		Explain Principal of operations for various Sensors and Transducers.
		Determine transfer functions for given Control system.
		Explain response of control system.
		Calculate time domain parameter for given system and Predict its Stability using appropriate Criteria.
		Calculate frequency domain parameter for given system and Predict its Stability using appropriate Criteria.
6	ELECTRONIC DEVICES AND CIRCUIT LAB (ECL301)	Outline of various equipment's, electronics devices and components, and measuring Instruments used to perform laboratory work.
		Explain functionality of various equipment's, electronics devices and Components and measuring instruments used to perform laboratory work.
		Use of various equipment's, devices, components and measuring devices using bread board as per the circuit diagram for experiment to be performed.
		Design experiment to gather appropriate data.
		Analyze data obtained from experiment to relate theory with experiment results

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7	DIGITAL SYSTEM AND DESIGN LAB (ECL302)	Identify various Digital ICs and basic building blocks of digital system design
		Design and implement combinational circuits like adder, subtractor, multiplexer, code converters etc.
		Identify and understand working of various types of flip flops and their inter conversions.
		Design and implement basic sequential circuits such as counters, registers etc.
		Acquire basic knowledge of VHDL/Verilog basic programming.
8	ELECTRONICS INSTRUMENTATION AND CONTROL(ECL303)	Sketch the plot and validate the performance characteristics of transducers.
		Observe the frequency response specifications of systems by using bode-plot, Polar plot,Nyquist-plot techniques, and comment on the stability of system
9	SKILL LAB: OOP USING JAVA AND C++ LAB (ECL304)	Describe the basic principles of OOP.
		Design and apply OOP principles for effective programming.
		Develop programming applications using OOP language.
		Create different programming applications using packaging.
		Analyze the strength of OOP.
		Percept the Utility and applicability of OOP.
10	MINI PROJECT-1A (ECC305)	Create the electronics circuit for particular application/experiment.
		Design and simulate the circuits by putting together the analog and digital components.
		Assess the technique of soldering and circuit implementation on general purpose printed circuit board (GPP).
		Analyze the PCB design process and gain up-to-date knowledge of PCB design software.
		Examine the basic electronic tools and equipment's
		Analysis of hardware fault (Fault detection and correction)

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YEAR: SE		SEM: IV SCHEME:C-SCHEME
SR.NO	**SUBJECT**	**COURSE OUTCOMES**
1	APPLIED MATHMATICS - IV (ECC401)	Use the concept of complex integration for evaluating integrals, computing residues and various contour integrals.
		Apply the concept of correlation and regression to engineering problems in data science , machine learning and AI.
		Apply the concept of probability and expectation for getting the spread of data and distribution of probabilities.
		Apply the concept of vectors spaces and orthogonalisation process in engineering problems.
		Use the concept of Quadratic forms and singular value decomposition which are very useful tools in various engineering applications.
		State the extremals of the functional using the concept of calculus of Variation.
2	MICROCONTROLLER (ECC402)	Discuss Computer and Microprocessor based System.
		Explain Memory for computer Systems
		Describe the detailed architecture of 8051
		Illustrate the programs for 8051 microcontrollers and Design an applications using microcontroller.
		Describe the detailed architecture of ARM7 Core.
		Select proper microcontroller for an application
3	LINEAR INTEGRATED CIRCUITS (ECC-403)	Explain the various current mirror circuits and analyze differential amplifier with active load
		Describe the linear application of operational amplifier
		Describe the non-linear application of operational amplifier
		Explain timer IC 555 with its applications
		Explain various voltage regulators
		Memorize the special function Integrated circuits
4	SIGNALS AND SYSTEMS (ECC404)	Classify and analyze different types of signals and systems.
		Analyze continuous and discrete time LTI signals and systems in transform domain.
		Analyze signals using Fourier series and analyze the systems using the Fourier transform.
		Analyze the systems using the Laplace transform.
		Analyze the systems using the Z - transform.
		Demonstrate the concepts learnt in signals and systems.Course using the modern engineering tools.
5	PRINCIPLES OF COMMUNICATION ENGINEERING (ECC405)	State the basic components and types of noises in communication system.
		Analyze the concepts of amplitude modulation and demodulation.
		Analyze the concepts of angle modulation and demodulation.
		Compare the performance of AM and FM receivers.
		Describe analog and digital pulse modulation techniques.
		Illustrate the principles of multiplexing and demultiplexing techniques.
6	MICROCONTROLLER LAB (ECL401)	Discuss different development tools required to develop microcontroller based systems.
		Prepare assembly language programs for arithmetic and logical operations, code conversion & data transfer operations.
		Prepare assembly language programs for general purpose I/O, Timers & Interrupts.
		Relate & write programs for Input and Output devices
		Develop microcontroller based Applications
7	LINEAR INTEGRATED CIRCUITS LAB (ECL-402)	Demonstrate and calculate linear and non-linear application of OP-AMP
		Demonstrate basic Amplifier Circuit using OP-AMP
		Use of P-spice model for different linear circuit.
8	PRINCIPLES OF COMMUNICATION ENGINEERING LAB (ECL403)	Analyze analog modulation techniques.
		Implement analog pulse modulation and demodulation circuits.
		Demonstrate digital pulse modulation and demodulation techniques.
		Justify the concepts of TDM and FDM.

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9	SKILL LAB: PYHON (ECL404)	Describe syntax and semantics in Python
		Illustrate different file handling operations
		Interpret object oriented programming in Python
		Design GUI Applications in Python
		Express proficiency in the handling Python libraries for data science
		Develop machine learning applications using Python
10	MINI PROJECT 1B (ECM401)	Prepare basic codes for the Arduino board using the IDE for utilizing the onboard resources
		Apply the knowledge of interfacing different devices to the Arduino board to accomplish a given task.
		Design Arduino based projects for a given problem.
		Prepare code using python language using IDE for utilizing the onboard resources.

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YEAR: TE		SEM: V SCHEME:C-SCHEME (R-19)
SR.NO	**SUBJECT**	**COURSE OUTCOMES**
1	DIGITAL COMMUNICATION (ECC501)	Apply the concept of Information theory in source coding.
		Compare different error control systems and apply various error detection codes.
		Analyze different error correcting codes .
		Compare various different band-pass transmission method for digital signal.
		Evaluate the performance of optimum baseband detection in the presence of white noise.
		Compare the performances of different digital modulation techniques
2	DISCRETE TIME SIGNAL PROCESSING (ECC502)	Recall the system representations and understand the relation between different transforms.
		Explain the concepts of discrete-time Fourier transform, fast Fourier transform and apply in system analysis.
		Design digital IIR and FIR filters to satisfy the given specifications and evaluate the frequency response and pole zero representations to choose a particular filter for the given application.
		Interpret the different realization structures of Digital IIR and FIR filters.
		Analyze the impact of hardware limitations on the performance of digital filters.
		Apply signal processing concepts, algorithms in applications related to the field of biomedical and audio signal processing.
3	DIGITAL VLSI (ECC503)	Explain various tools and processes used in VLSI Design.
		Explain working of various CMOS combinational and sequential circuits used in VLSI Design.
		Derive expressions for performance parameters of basic building blocks like CMOS inverter.
		Relate performance parameters with design parameters of VLSI circuits.
		Select suitable circuit and design style for given application.
		Design and realize various combinational and sequential circuits for given specifications.
4	RANDOM SIGNAL ANALYSIS (ECC504)	Apply theory of probability in identifying and solving relevant problems.
		Differentiate continuous and discrete random variables and their distributions.
		Analyze mean, variance, and distribution function of random variable.
		Analyze functions of multiple random variables.
		Define random process, determine the type of the process and find the response of LTI system for WSS process.
		Explain linear regression algorithm and apply for predictive applications.
5	DIGITAL AND IPTV ENGINEERING (ECCDLO 5011)	Explain the working principles of advanced digital television systems.
		Recognize to choose or develop an appropriate camcorder and displays based on applications.
		Summarize with current digital TV standards.
		Evaluate the Stereoscopic images and binocular depth perception.
		Restate the knowledge of IPTV and develop hardware and protocols.
		Outline different threats and countermeasure.
6	DIGITAL COMMUNICATION LAB (ECL501)	Compare various source coding schemes.
		Design and implement different error correction codes.
		Compare various line coding techniques.
		Demonstrate various digital modulation techniques.
7	DISCRETE TIME SIGNAL PROCESSING (ECL502)	Implement and analyse the basic performance of magnitude,phase and impulse response of discrete time signals using MATLAB
		Design FIR filter for band pass,low pass and high pass filter using MATLAB
		Design and implement IIR Filters for given specifications.
		Analyze perfomance of circular convolution for discrete time signals and verify the output

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8	DIGITAL VLSI LAB (ECL503)	Discuss the semiconductor technology, scaling and performance
		Analyze logic circuits with different design styles.
		Explain the operation of memory, storage circuits and data path elements
		Explain VLSI clocking style & I/O Circuit
9	BUSINESS COMMUNICATION AND ETHICS LAB (ECL504)	Discuss buisness and professional writing skill
		Interpret technical proposal at buisness level.
		Apply interpersonal skill like leadership, team building and management proficiency.
		Illustrate ethical code of conduct in buisness and corparate activities.
		Illustrate employment skill like presentaiton skill, interview technique and group discussion.
10	MINI-PROJECT 2A-EMBEDDED SYSTEM PROJECT	Explain the embedded systems with design metrics.
		Use of microcontrollers and apply programming in Embedded C.
		Compose Embedded systems with different sensors and peripherals as IoT.
		Compose Embedded systems with different communication protocols as IoT.
		Design embedded system applications using sensors, peripherals and RTOS
		Analyze concepts of Real time operating systems.

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YEAR: TE	SEM: VI	SCHEME:C-SCHEME
SR.NO	**SUBJECT**	**COURSE OUTCOMES**
1	ELECTROMAGNETIC AND ANTENNA (ECC601)	Describe electromagnetics field including static and dynamic in terms of Maxwell's equations.
		Apply Maxwell's equation to solve various electromagnetic phenomenon such as electromagnetic wave propagation in different medium, power in EM wave.
		Discuss and analysis of antennas.
		Analyze of antenna arrays.
		Analyze different types of antenna.
		Analyze different types of wave propagation.
2	COMPUTER COMMUNICATION NETWORKS (ECC602)	Analyze network topologies, hardware devices, addressing schemes and the protocol stacks
		Compare various transmission media and broadband technologies
		Analyze the flow control, error control and the medium access control techniques
		Judge network layer addressing and routing schemes
		Analyze connection oriented and connectionless services
		Apply the knowledge of application layer protocols
3	IMAGE PROCESSING AND MACHINE VISION (ECC603)	Explain fundamentals of image processing and machine vision .
		Examine the quality of image using spatial and frequency domain techniques for image enhancement
		Explain image morphology and restoration techniques
		Explain image segmentation techniques based on principle of discontinuity and similarity using various algorithms.
		Prepare boundaries and shapes using standard techniques.
		Classify the object using different classification methods .
4	ARTIFICIAL NEURAL NETWORK AND FUZZY LOGIC (ECC604)	Describe the concepts of biological neurons and artificial neurons.
		Analyze the feed-forward neural networks and their learning algorithms.
		Analyze the feedback neural networks and their learning algorithms.
		Explain the neural network training and design concepts.
		Develope a simple CNN model and apply in image classification.
		Analyze the application of neural networks and fuzzy logic to real world problems.
5	RADAR ENGINEERING (ECCDLO6016)	Explain generalized concept of RADAR.
		Solve problems using radar equations.
		Describe different types of radar for specific application.
		Explain concept of tracking radar.
		Sketch the RADAR target from given specification.
6	ELECTROMAGNETIC AND ANTENNA LAB (ECL601)	Classify different antenna parameters.
		Use of MATLAB software for different types of antenna
7	COMPUTER COMMUNICATION NETWORKS LAB (ECL602)	Discuss network tools and their configuration.
		Construct the configuration of various network devices.
		Design the network topology and services eg. Telnet, FTP.
		Demonstrate knowledge of programming for network communications.
		Analyze the topology in NS-2 and configuration of WSN nodes with TCP and UDP.
9	IMAGE PROCESSING AND MACHINE VISION LAB (ECL604)	To perform enhancement of digital images in spatial and frequency domain
		To perform edge detection and morphological operations on digital images
		To classify patterns using standard Machine vision classification techniques like SVM
		To apply theoretical knowledge in image processing and machine vision to practical case studies

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10	Skill Laboratory: Linux & Networking &Server Configuration	Install Linux using different platform and execute standard Linux commands.
		Describe the basic knowledge of Linux Operating System
		Illustrate the system administrative functionality
		Solve the problems using shell script programming
11	Mini Project 2B: FPGA based Project	Describe various FPGA families and method of FPGA synthesis and implementation
		Explain the working of basic EDA tools like Xilinx, Modelsim cadence , etc
		Use software to simulate and synthesize circuits in Verilog HDL.
		Develop the technique of interfacing of LED, switches and seven segment with FPGA.
		Explain the project documentation, designing and handling techniques.

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YEAR: BE	SEM: VII SCHEME:C- Scheme	
SR.NO	**SUBJECT**	**COURSE OUTCOMES**
1	ECC701 Microwave Engineering	Explain the microwaves, transmission lines and design matching networks.
		Differentiate and identify waveguides and microwave components
		State generation and amplification of microwaves
		Identify semiconductor devices
		Assess microwave measurements.
		Explain types of microwave integrated circuits.
2	ECC702 Mobile Communication System	Explain the cellular fundamentals and estimate the coverage and capacity of cellular systems.
		Classify different types of propagation models and analyze the link budget.
		Illustrate the fundamentals and system architecture of GSM, 2.5G and IS-95.
		Apply the concepts of 3G technologies of UMTS and CDMA 2000.
		Elaborate the principles of 3GPP LTE.
		Identify the emerging technologies for upcoming mobile communication systems.
3	ECCDLO 7014 Big Data Analytics	Interpret Big Data and its analytics in the real world.
		Analyze the Big Data framework like Hadoop and NOSQL to efficiently store and process Big Data to generate analytics
		Interpret different NoSQL systems and how it handles big data
		Explain HDFS concepts, interfaces, and basic file system operations. Develop and implement Map reduce applications on hadoop
		Design applications for Big Data Analysis using Hadoop and NoSQL.
		Examine the specialized aspects of big data with the help of different big data applications
4	ECCDLO 7023 Internet Communication Engineering	Compare the protocols at each layer of TCP/IP protocol suite.
		Explain the internet security aspects of protocols at various layers of TCP/IP protocol suite.
		Apply the various compression algorithms for audio, image & video coding.
		Design simple networked multimedia systems.
		Compare integrated & differentiated services for quality of service.
		Explain a software defined Network.
5	ILO 7016 Cyber Security and Laws	Analyze the concept of cyber crime and define its aspects of outside world.
		Apply IT law in various legal issues
		Analyze and Evaluate different aspects of cyber law
		Evaluate the concept of Cyberspace and Intellectual property aspect.
		Recognize different Indian Act based on cyber security.
		Compile and Apply Information Security Standards during software design and development.
6	ECL701 Microwave Engineering Laboratory	Explain different components used in lab.
		Measure S-parameters of two port networks
		Analyze characteristics of reflex klystron
		Show analysis of microstrip lines
		Analyze the properties of Magic Tee
		Analyze the properties of Directional coupler
		Examine VSWR measurement using test bench
		Express V-I Characteristic of GUNN diode
7	ECL702 Mobile Communication System Laboratory	Use of AT commands of MHT software to perform different task on MHT hardware
		Use of CDMA Architecture in Mobile Communication System
		Use of GPRS Architecture in Mobile Communication System

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YEAR: BE	SEM: VIII	SCHEME:C- scheme
SR.NO	**SUBJECT**	**COURSE OUTCOMES**
1	ECC801 Optical Communication and Networks	Explain optical networks at large by identifying the types of fibers, cables and deployment.
		Design point to point optical fiber communication links using appropriate optical fibers, light sources, couplers, detectors, and multiplexers.
		Design a short haul or long-haul optical network with repeater by incorporating suitable amplifiers.
		Compare SDH, PDH and WDM techniques and implement.
		Express concepts of designing and operating principles of modern optical communication systems and networks
		Apply the knowledge acquired to design the next generation fiber and FSO networks for indoor and outdoor applications
2	ECCDLO 8013 Wireless Networks	Explain the fundamentals, architecture, design issues and standards of wireless networks along with Body Area Network (BAN).
		Describe personal area network (PAN) technologies such as Zigbee, Bluetooth, UWB, RFID, NFC etc.
		Lists different LAN topologies and technologies.
		Illustrate the fundamentals and architecture of wireless Metropolitan Area Networks (WMAN) and describe the phases of planning and design of wireless networks
		Describe various wireless adhoc networks architecture, traffic related protocols and transmission technology.
		Explain basic architecture and working of WSN, WMN and IOT.
3	ECCDLO 8023 Network Management in Telecommunication	Outline the overview of network management with all prospective.
		Explain OSI network management standards and models.
		Explain about SNNP models with proxy servers and RMON.
		Illustrate the concept of broadband network management and ATM technology .
		Apply the network management application to different models in the system.
		Define telecommunication management networks with conceptual model standard and Architecture.
4	ILO 8019 Environmental Management	Identify environment, management, systems & organisations in relation to environmental management.
		Demonstrate an integrative approach to environmental issues with a focus on sustainability.
		Understand concepts of ecology
		Understand corporate environmental responsibility & environment quality management.
		Identify the role of the IS 14000 series of standard in industry.
		General overview of major legislations of different types of environmental act.
5	ECL801 Optical Communication and Networks Laboratory	Acquire proficiency in identifying the different types of fibers and understanding their properties.
		To measure the losses, dispersion and compensation techniques in all optical network.
		Design all optical network with amplifiers and modern lasers for error free transmission.
		To design or implement point to point optical fiber network, WDM or DWDM Network.

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Department of Master of Management Studies

ACADEMIC YEAR 2022-23

COURSE OUTCOMES

YEAR: FY	SEM: 1	
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Perspective Management (MMS-C101)	Define multiple perspectives that impact business and life.
		Demonstrate empirical to demonstrate empirical organizational processes and behaviors and the theories associated with them
		Define demonstrate leadership behaviours which will be three pronged leading self, leading for change and impact
		Explore different approaches and their consequences during crisis management
		Understand the role of managers and citizens in society
		Classify ways of staying positive and having a healthy mind
		Understand the roles and functions of managers at various (entry, middle and the top level) levels
		Examine the behavior, skills and mindset of a manager and of a leader.
		Analyze various concepts and examples related to strategic management
		Define about the various steps to be followed to bring about change
		Understand the concepts and examples of TQM
2	Financial Accounting (MMS-C102)	Define clarity and Understand the basic concepts of accounting and financial statements
		Understand the principles of revenue recognition and ability to distinguish between revenue and capital income
		Explain different methods of depreciation and their impact on profitability and assets valuation
		Apply the principles and concepts of accounting in preparing the financial statements
		Understand the concepts of inventory valuation and their effect on profit and cost of goods sold
		Define ability to prepare a statement of changes in financial position with respect to working capital and cash flow.
		Create ability to execute the accounting process recording-classifying and summarizing.
		Identify detailed and in depth Understand of all the items in the corporate financial statements
		Understand and the ability to read Annual reports,presentation and analysis of audit reports and directors' report
		Define basic cost concepts and the ability to prepare a simple cost sheet
		Understand the difference between errors and frauds: creative accounting and the corporate governance report.
3	Business Statistics (MMS-C103)	Apply these basic concepts in business situations, analyse charts graphs to analyse business situations
		Understand the uncertainty in business situations as probability
		Understand the decision under risk, use of conditional expectation as basis for comparison
		Explain distributions in quality control, Six sigma and process control
		Analyze importance of central limit theorem
		Understand the confidence interval as way of hypothesis testing
		Understand the multiple base model building
4	Operations Management (MMS-C104)	Understand the basic concepts and learn how to apply the same.
		Understand the physical processes
		Identify characteristics of product, machine and workflow
		Define stock and cost implications
		Identify capacity utility utilization, overall production planning and control
		Identify concept of dependency
		Understand and implement optimal ordering of jobs
		Apply application of operation to services
		Identify measurement of time management
		Choose quality and identify methods. Understand sources of variation and identify them on charts, process improvement
		Explain global standards, cost reduction
		Define basic concept of supply chain
5	Managerial Economics (MMS-C105)	Analyse and apply the practice of managerial economics knowledge
		Identify the businessman need to locate various factors affecting demand of his product and plan marketing and business strategies accordingly.
		Develop an Understand of the various concepts and its applications
		Explain analytics of supply and demand and its various uses.
		Define students should get an holistic Understand of production economy
		Define the relationship between costs, revenues, profits and losses
		Identify about the intricacies of the various market forms and their impact on the economy and business
		Define students about various pricing practices
		Learn about the role of profit in business
		Define realize the importance of the different methods of capital budgeting as a tool of project management
6	Effective and Management Communication (MMS-C106)	Explain mechanics behind the communication process, difficulties experienced in communication
		Identify different types of communication, impedance due to extraneous factors called 'barriers'
		Define important non-verbal parameters in communication
		Understand the process of communication effective and attractive
		Explain communication in groups, guidelines to improve performance/effectiveness in group interactions
		Explain convincing and forceful public speaker
		Identify ability to achieve impressive and meaningful written communication
		Define correct and effective report writing techniques
		Understand the cultural diversity and business etiquette with foreign clients
		Analyze methods of effective audiovisual communication
		Define experiential learning through audio-visual means
7	Negotiation and selling skills (MMS-C112)	Explain concept of negotiation
		Understand the providing deeper insight related to negotiation framework
		Identify familiarizing students with basics of models in negotiation and strategies
		Understand the concept of difference between marketing and selling and giving them useful tips for succeeding in Sales
		Define creating awareness about importance of customer in selling
		Analyze familiarizing students with different approaches required for selling different relevant stakeholders
		Define familiarizing students with different approaches required for selling to different segments of customers.
		Explain awareness about challenges and opportunities available in Start-ups domains
		Enhance effectiveness of a salesperson by understand clues provided by body language
8	Organizational Behaviour (MMS-C109)	Define the scope of organizational behavior at individual, group, organizational and societal levels
		Understand the concepts of group dynamics, team effectiveness, team roles and conflict management
		Define the concept of leadership and distinguish between a number of different leadership theories
		Identify the different bases of power; and discuss how individuals and groups use power in organizations
		Understand the impact of organizational culture and structure on organizational behavior
		Define the concept and practice of change management and organizational development.
		Analyze the nature and scope of organizational behaviour.
		Analyze the concepts of group dynamics, team effectiveness, team roles and conflict management.
		Define distinguish between various theories of motivation and their application in the organizations.
		Develop the impact of organizational culture and structure.

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Department of Master of Management Studies

ACADEMIC YEAR 2022-23

COURSE OUTCOMES

YEAR: FY	SEM: 2	
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Marketing Management (MMS-C201)	Analyze the concepts in the marketing with respect to historical development of the subject
		Define fundamental concepts and vocabulary or practices from business perspective in the organization.
		Define marketing students with various concepts related to market opportunities available in various sectors
		Familiarize students with new highlight to compare various research and its utility.
		Explain consumer buying behavioural process vis a vis organizational buying behaviour process
		Analyze imparting knowledge of various important marketing concepts
		Understand various practices related to the important aspects of marketing in decision making
		Explain mechanism of developing a new product related process
		Familiarize students with various concepts related to communication design process in effective marketing practice
		Understand the pricing dynamics being practiced by the organizations in different sectors
		Analyse basics of various models and their application in their field of work
		Identify operational issues in order to support marketing process
2	Financial Management (MMS-C202)	Understand the basic concepts of corporate finance and Indian financial system
		Analyse the financial statements of companies using ratios
		Ability to calculate working capital requirements; evaluate working capital policies and explain the operating and cash cycle
		Explain the pro-forma financial statements and calculate the EFR
		Understand the various evaluation techniques like NPV, IRR, PI, payback period etc. for evaluating capital expenditure decision
		Understand the features and characteristics of various financing options
		Explain different capital structure theories and the impact of D/E ratio on EPS
		Create the design of capital structure
		Understand the impact of dividend payout ratio and retention ratio on company's financial position
3	Operations Research (MMS-C203)	Understand the application in business. data envelopment Analysis as extension of LPP model
		Understand special cases of LPP and apply in appropriate situation
		Understand competitive environment of business
		Understand project management techniques
		Understand queue model as a measure of performance of system
		Identify In want of assumptions of the model a working system can be created
4	Business Research Methods (MMS-C204)	Explain types of research and features of a good research study.
		Understand the research problem
		Identify meaning of research designs
		Classify secondary data types and sources of primary data
		Identify types of measurement scales
		Define questionnaire method and types of questionnaires
		Analyze sampling concepts
		Define descriptive vs inferential analysis
		Explain testing of hypothesis and chi square test
		Understand the completely randomized design in a one-way ANOVA
5	Human Resource Management (MMS-C205)	Apply the theoretical and practical aspects of human resource management to formulate strategies
		Explain operational and strategic goals related to the organization's human capital
		Define the study the personnel function with respect to its organization
		Understand the importance and the process of man power planning
		Define the application of the theories of motivation
		Explain the importance and process of performance management
		Describe the steps required to analyze needs, develop and evaluate an employee training and development programs in organizations
		Define the concept and practice of change management and organizational development
6	Cost and Management Accounting (MMS-C207)	Understand the concepts related to financial, cost and management accounting
		Understand the difference between direct and indirect cost as well as apportionment and allocation of cost
		Define ability to prepare the cost sheet
		Understand the computation methods of cost under various costing methods
		Identify ability to make decisions using marginal cost concept and calculate BEP and margin of safety
		Ability to prepare various types of budgets and analyze the functional as well as the master budgets
		Define set a benchmark and calculate and analyze variances.
		Understand the various responsibility centers and different transfer pricing methods for setting interdepartmental price
		Understand the concepts and application of activity based costing
		Evaluate the selling price based on pre-determined target
		Evaluate the cost of a product as it moves through the various phases of its life cycle
		Identify the direct costs and allocate indirect costs to present information on social, environmental costs and benefits
7	Legal and tax aspects of Business (MMS-C206)	Define law and the concepts of parties to the contract, consideration and other legal concepts related to contract
		Explain meaning of sale of goods and the rights and duties of vendor and consumer under the Act
		Explain various negotiable instruments available under the Act
		Define rights and duties of consumers under the consumer protection Act
		Understand the requirements of forming a company
		Understand the meaning and definition of intellectual property
		Understand the framework of Indian Income Tax Act with concepts of tax slabs, TDS, etc.
		Explain the income tax and tax liability of various assesses based on different cases
		Explain concepts of indirect taxes and CENVAT
		Understand the scope and coverage of customs Act.
		Understand the difference between MVAT and State Sales tax and the tax slabs and exemptions in the Act.
8	Business Environment (MMS-C208)	Analyse and understand the environment in business
		Understand the need for various campaigns and also the impact of changes in the various macroeconomic variables on economy as well as on business.
		Define the need for various campaigns on business.
		Identify the union budget and its impact on the various sectors
		Understand the opportunities and challenges of the policies relating to LPG with reference to business
		Identify the role of the external sector as well as multilateral organization

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Department of Master of Management Studies

ACADEMIC YEAR 2022-23

COURSE OUTCOMES

YEAR: SY	SEM: 3	Specialization - FINANCE
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Financial Markets and Institutions (MMS-F304)	Understand the Indian financial system and its components
		Explain role of RBI in the IFS
		Enhance comprehension of stock exchange functioning and various products issued by different financial institutions in primary market of India
		Identify ability to Understand different financial products issued in domestic and foreign markets
		Explain new markets,products and players
		Explain basics of derivative products available in financial markets
		Identify comprehend the working of intermediaries
		Explain different concepts of fixed income securities
		Identify the different measures of risk of fixed income securities
		Explain general understand of the currency markets and its role in the financial system
2	Financial Regulations (MMS-F307)	Explain regulatory framework of Indian financial system
		Understand the financial regulations framework and its significance in financial system
		Define clarity and understand the framework of various financial regulatory and statutory bodies
		Define clarity and understand the regulatory framework with respect to SEBI in regulating the capital market
		Define regulatory framework of IRDA and CCI
		Understand the clarity on money laundering concept and its regulation
		Understand the significance of regulating the credit rating agencies
		Understand the significance of FEMA and foreign trade policy framework
		Understand the basics of derivatives markets
		Understand the process of pricing and valuation of forwards and futures
		Explain mechanics of options and creating synthetic options
3	Derivatives and Risk Management (MMS-F308)	Define valuations of pay off of each strategy
		Understand the functions of options
		Understand risk assessment methods
		Understand the market volatility and its relation to demand and supply of options
		Understand the process of trading, clearing and settlement
		Identify and understand the basic concepts of investment
4	Investment Banking (MMS-F310)	Understand the functions of investment banking
		Explain core functions of market intermediaries
		Identify concept of merchant banking
		Identify concept of IPO, FPO and important provisions of ICDR
		Explain concept of underwriting as well as underwriters services in IPO process
		Explain developing skills in valuation in an M and A setting
		Define the buyback and delisting process
		Understand the international bonds market
		Define learning, need, and scope of corporate restructuring, mode in restructuring process
		Define the framework of private placements
5	Security Analysis and Portfolio Management (MMS-F306)	Understand the basics of securities and define risk return analysis using CAPM
		Explain prices using valuation of equity shares
		Analysis and valuation of the fixed income securities
		Identify ability of creating and tracking index
		Identify ability to carry on technical analysis
		Apply capital market theories
		Understand and applying the factor models and APT
		Understand and applying the investment decision theory
		Understand and applying the portfolio theory
6	Corporate Valuation and Mergers and Acquisitions (MMS-F305)	Understand the basic concepts of valuation and the interplay of factors affecting value
		Understand the role of leverage, working capital and tax in the value of the business
		Calculate the elements of risk, return and cash flows
		Understand the flow of valuation using discounted cash flow methods and calculate the same
		Identify different relative valuation methods used in valuation
		Understand the use of real options in valuation (with help of binomial model and black and Scholes model)
		Understand the guidelines to be followed in valuation reports
		Explain the different methods of valuation
		Define alternative business strategies and how it contributes to creation of wealth for shareholders

YEAR: SY	SEM: 3	Specialization - HUMAN RESOURCE MANAGEMENT
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Training and Development (MMS-H304)	Understand the concept of human resource development
		Explain evaluation of training
		Understand the concept of learning organization
		Define adult learning and different learning styles
		Explain the training budget calendar and training modules
		Explain the process of training needs assessment
		Define the method of competency modeling and mapping
		Explain design training module
		Explain various types of training
		Explain the concept of management development
		Understand the philosophy of human resources
2	Compensation and Benefits (MMS-H305)	Understand business context for rewarding strategies and preparing strategies
		Classify elements of Compensation Structure
		Understand compensation / remuneration plan in reward strategy
		Explain learning to cost the CTC of each element of compensation Structure
		Define concept of inflation
		Understand provident fund, ESIC, gratuity, superannuation, bonus under payment of bonus Act
		Explain learning various types of variable pay
		Define concept of income tax
		Define preparing the CTC of an employee
		Identify the learning the details of remuneration survey
		Enhance learning the use of competency pays plans
		Explain knowledge about running the assessment center and report writing
3	Competency Based HRM and Performance Management (MMS-H306)	Define concept of competency and its models
		Explain the conceptual frame work of performance management system and its link with HR practices
		Explain translate data collection in mapping process
		Identify applying about the implementation of performance management system, issues and challenges
		Understand process of conducting staff appraisal
		Understand performance counseling
		Understand overview of ethical practices in performance management
		Define rewards for performance
4	Labour Laws and Implications on Industrial Relations (MMS-H307)	Define importance of IR to labour laws, changing dynamics of IPR
		Understand court jurisdictions and basics of labor laws
		Understand the study of history, provisions, case laws and amendments under acts
		Define just an overview of needs to be taught
		Define the concept of workforce diversity
5	Human Resource Planning and Application of Technology in HR (MMS-H308)	Define the overview of application of technology in HR
		Define the concept of HR planning and selection
		Understand nuances of HR and planning
		Explain introduction to HRIS
		Explain introduction to HR analytics
6	Employee Relations, Labour Laws and Dispute Resolution (MMS-H315)	Discuss the history of the HR movement and trough in HR
		Discuss various definition of IR and IR approaches with their advantages and disadvantages
		Define the genesis of conflict in IR and various methods to prevent the same
		Explain the methods to solve the conflict
		Explain employee brand
		Explain creation and operationalization of employee brand
		Identify high light the importance labour welfare and workers participation in management

YEAR: SY	SEM: 3	Specialization - MARKETING
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Sales Management (MMS-M304)	Familiarising the students with the sales and sales management function
		Understand about sales organizations structures
		Develop an appreciation of negotiations and sales of services and physical good
		Identify attitude and skills for sales force. Developing an territory management
		Explain familiarising students with sales and marketing techniques
		Define learning tools and techniques for sales territory management
		Develop an Understand of the Art of positive evaluation
		Classify developing skills to effectively manage sales force.
		Explain learning to calculate delivery schedules
		Understand relationships between the present sales and future plans of the organization as well as an appreciation of costs.
		Understand basics of marketing strategy
2	Marketing Strategy (MMS-M305)	Understand strategic aspects of new product development and commercialization
		Understand and apply various metrics to evaluate marketing strategies
		Understand issues in formulating product and brand strategies
		Understand levers to manage
		Understand marketing plan.
		Identify issues in the design and management of channel
3	Consumer Behaviour (MMS-M306)	Understand the concept of consumer behavior
		Understand the consumer behavior has changed due to digital revolution models of consumer behaviour
		Understand the psychological and physiological aspects of consumer behaviour
		Explain marketing applications of consumer perception theory
		Define consumer learning theories and processes and its impact on consumer behaviour
		Explain various models pertaining to consumer attitudes and their impact on marketing
		Explain developments of personalities through different theories
		Define the concepts of consumer behaviour of social classes
		Identify influence of cultures and groups and families on the diffusion of innovation and adoption of new products
		Understand the impact of culture and values on Indian consumer
		Identify in post purchase decisions
		Explain B2B buying process
4	Service Marketing (MMS-M307)	Understand the consumer behavior in service industry
		Understand the gaps in service delivery
		Analyze how to forecast demand, Planning delivery and capacity by using service as assets of an organization
		Define students will be able to Understand how to use complaints as an opportunity for service recovery and enhance customer loyalty
		Explain how companies align internal capabilities to deliver external promises for customer loyalty
		Understand the use of CRM in customer satisfaction and retention
		Prepare for service sector by evaluating, giving feedback on their presentation for service sector organization
5	Retail Management (MMS-M309)	Understand the basics of retailing
		Understand the different retail formats
		Explain issues in supply chain
		Understand the customer experience and engagement
		Explain market segmentation and Pricing Strategy
		Define web based retailing
6	Product and Brand Management (MMS-M308)	Understand functions of product management
		Explain portfolio analysis and tools
		Define relationship between product strategy and PLC
		Understand the NPD process
		Explain Financial implications across PLC
		Explain fundamentals of brand management
		Explain brand development process
		Define branding decisions
		Define brand equity and its measure

YEAR: SY	SEM: 3	Specialization - OPERATIONS
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Supply Chain Management (MMS-O304)	Explain supply chain and logistics concept
		Explain warehousing function and distribution channel
		Identify warehouse process and logistics information system
		Explain customer service and performance measurement
		Understand the transportation modes and distribution network
		Explain importance of information in supply chain
		Define various outsourcing activities and RSP
		Explain procurement through Internet and impact.
		Identify various international issues and challenges and performance measurements to supply chain
		Explain various ethics. Rules and regulations in supply chain
		Understand the recent trends in supply chain and its forecasting and predictions
2	Operation Analytics (MMS-O305)	Explain use of various techniques for demand forecasting
		Evaluate the appropriateness of the projective technique
		Understand the service efficiency analysis
		Identify the management services of operations in Retail
		Identify the supply chain related measurement
		Understand the analyze and list the risk and performance of supply chain
		know the reporting of the analytics
		Understand the performance metrics in various cases
3	Service Operations Management (MMS-O306)	Explain work flow of services and complexity of services
		Identify quantitative tools for decision making
		Define developing quantitative ability for decision making
		Identify developing quantitative ability
		Explain inventory in service industry and profitability in service industry
		Explain outsourcing concept in services
		Define inventory control in service industry
		Explain assessment of performance of services
		Identify inventory control in service industry
4	Manufacturing Resource Planning and control (MMS-O307)	Analyze profitability in service industry.
		Explain capacity of management
5	Materials Management (MMS-O308)	Explain preparation for the course in respect operations as well as organization
		Explain planning with financial perspective understand impact of MRP on financial statements
		Explain overview of purchasing activities
		Understand the detailed understand of purchase process
		Define basic understand of purchase of projects
		Define basic introduction to imports
		Understand how industry give selective importance to specific materials
		Explain controls over materials
		Identify impact codification on computerization and decision making
		Understand importance of standardization
		Explain process and financial impacts
		Identify learning the industry process and its financial impact
		Explain importance of ethics in materials management
		Explain introduction to materials handling
6	Total Quality Management (MMS-O314)	Understand the concept of quality
		Identify the development of quality tools
		Understand the statistical techniques and tools for quality control
		Understand the methodology of sampling
		Understand the techniques and tools for quality control
		Understand the role of employee and their involvement
		Define the role of inspection in quality
		Define measure the process capabilities
		Understand the relation of cost and quality
		Explain time and lean manufacturing

YEAR: SY	SEM: 3	Specialization - SYSTEMS
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Data Base Management System and Data Warehousing (MMS-S304)	Explain knowing about the distributed databases
		Explain concepts of RDBMS and normalization process
		Define application of SQL in DBMS
		Understand the OOD w.r.t RDBMS and its advantages
		Explain gaining an insight on database security and user rights
		Understand the concept of data warehousing
		Understand the concept of data mining
		Understand the role of enterprise management systems in business
2	Enterprise Management System (MMS-S305)	Identify gaining an insight on applications of EMS in various industry verticals
		Explain gain an insight on role of content management, challenges w.r.t building cashless organizations
		Understand the concept of enterprise portal and related technologies
		Identifying and solving the challenges in integrating various enterprise applications
		Understand the applications of ERP in SCM and logistics management
3	Big Data and Business Analytics (MMS-S306)	Explain gain an insight on analytical tools and methods
		Understand the basic concepts of big data and business analytics
		Understand the predictive analytics and forecasting method w.r.t business analytics
		Understand the statistical computing methods like NLP, regression and other BI tools
		Explain the SRS designing and various stages involved in software development
4	Software Engineering (MMS-S308)	Understand the software life-cycles and methodologies
		Understand the quality assurance and system testing w.r.t to software development
		Show gaining an insight on business metrics and data science in statistical computing
		Explain SRS designing and various stages involved in software development
5	Information System Security and Audit (MMS-S310)	Explain the need for control gain an insight on business information and related assets
		Identify information protection and application systems can be understood and applied
		Identify information protection application infrastructure w.r.t networks can be learned and applied
		Explain control framework
		Define business continuity planning and implementation can be learn
		Understand the latest opportunities in IT audit
		Understand the basics in audit process
		Explain clarity and Understand of the basic concepts in wealth management
		Explain risk return trade off
6	Knowledge Management (MMS-S307)	Explain knowledge management infrastructure, solutions and various components related to KM foundation can also be well understood and applied
		Understand the KM structure, organization culture and role of IT in facilitating the KM implementation.
		Apply the principles and concepts of wealth management
		Show gain an insight on KM dimensions, barriers and performance factors w.r.t KM

YEAR: SY	SEM: 3	Specialization - Common Subjects
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Strategic Management (MMS-C302)	Identify familiarization and processes of strategic management
		Understand of strategic management so as to enable the students shoulder responsibilities in the ever changing global arena
		Identify environmental scanning and appreciation of external business environment
		Define SBU portfolio management
		Define acquaintance with tools of strategic fit
		Understand industry analysis and sustainable competitive advantage
		Explain leveraging sustainable unique advantage with path dependence
		Identify strategic gaps in the market and filling them with unique advantage
		Understand the organizational growth options, strategizing and implementing them
		Understand the non-financial perspective and strategic parameters in the globalized world
2	International Business (MMS-C301)	Explain clarity and understand the basic concepts in wealth management
		Apply the principles and concepts of wealth management
		Understand the risk return trade off
		Detailed and in depth understand traditional asset classes and define alternate asset class
		Understand the principles of portfolio modelling and its practical use
		Understand the importance of insurance,the various insurance policies and ability to calculate HLV
		Understand the concepts of retirement planning and tax implications ability to preserve the wealth

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Department of Master of Management Studies

ACADEMIC YEAR 2022-23

COURSE OUTCOMES

YEAR: SY	SEM: 4	Specialization - FINANCE
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Venture Capital (MMS-F407)	Explain private equity process
		Understand how corporates invest in a new private equity
		Explain awareness of the investment planning patterns, problems and issues faced by industries and PE investor
		Understand financial valuation methods and strategies and the impact of dilution
		Explain the integrating valuation with term sheet
		Understand the documents and critical pointers to due diligence
		Understand the strategies made to negotiate and exit the fund
		Understand the PE funds regulation
		Explain overview of taxation aspects while choosing PE as an investment
		Identify importance of ethics and value system
		Explain trends of the PE funding in the developing economies

YEAR: SY	SEM: 4	Specialization - HRM
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Od and change Management (MMS-H405)	Understand the process of change in detail
		Explain impact of change on internal environment
		Understand the role of organizational culture and its impact on change management
		Explain introduction to the concept of OD
		Explain different approaches to OD
		Identify diagnosis and different diagnostic models
		Explain introduction of methods to monitoring change
		Define latest trends in OD and change management

YEAR: SY	SEM: 4	Specialization - MARKETING
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Business to Business (MMS-M406)	Understand the basics of B2B marketing
		Explain the Industrial marketing environment
		Understand the segmentation parameters in B2B marketing
		Understand the consequences of investment decisions in identifying markets.
		Understand the dynamics of B2B from specialty to commodity.
		Explain the strategies for value added products and services.
		Explain different types of customer benefits
		Classify various models of organisation buying behaviour
		Understand how to identify and manage key accounts
		Understand the importance of developing a competitive advantage in dominant designs

YEAR: SY	SEM: 4	Specialization - OPERATIONS
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Strategic Sourcing in Supply Management (MMS-O406)	Explain development of Basic purchasing strategies
		Define pattern of spending and costing
		Understand the purchase cycle from requisition to payment
		Explain basic introduction to imports
		Explain the types of purchase orders
		Classify about various types of items
		Understand the organization structure and link between purchase and supply chain function
		Understand the supplier evolution and selection
		Explain tools used in purchasing.
		Explain the worldwide sourcing with currency impact
		Define costing and reduction of cost.

YEAR: SY	SEM: 4	Specialization - Systems
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Strategic Information Technology Management (MMS-S405)	Understand the role of information systems in strategic role of IT in gaining competitive edge
		Explain basic Understand of enterprise systems
		Understand the importance of decision making using data mining and BI tools
		Understand the web based research tools
		Define grasping with the latest trends in strategic IT domain
		Identify learning the process of developing IT strategy and creating frameworks for web and mobile development
		Identify concepts of basics of project management, evaluate new projects proposals, prepare detailed project report
		Understand the network diagram, critical path, concepts of crashing network

YEAR: SY	SEM: 4	Specialization - Common Subject
Course Outcomes: After successful completion of the course students will be able to:		
SR.NO	SUBJECT	COURSE OUTCOMES
1	Project management (MMS-C401)	Classify concepts of basics of project management
		Understand the network diagram, critical path, concepts of crashing network
		Explain risks in project management, make resource charts, find probability of completion of project
		Understand the organization structure, flow of authority and responsibility
		Understand the concepts of earned value, prepare revised estimates of cost and time.
		Evaluate project financially, make projected statements of proposal
		[illegible]nt this software's to the students