

SEM III

Course Code	Course Name	CO1	CO2	CO3	CO4
CE-C301	Applied Mathematics- III	Students will be understand the basic concept of Laplace transform	Students will be able to apply linear transformation and conformal mapping.	Students will evaluate contour integral and solve equation using Fourier integral.	Students will solve initial and B.V.P using ordinary differential equation and will be able to understand the concept of co-relation regression.
CE-C302	Surveying I	Students will understand basic principles, objectives and classifications of surveying and will be able to perform linear measurements by chain surveying along with ranging, offsetting.	Students will get an idea about different bearings and shall analyse the traverse with corrections by compass surveying.	Students will get the knowledge of different levelling concepts and will be able to find reduced levels at any point using different levelling instruments.	Students will plot contour justifying various characteristics and shall plot traverse using plane table and compute area of survey plot and volume of earthwork using different computational methods.
CE-C303	Strength Of Material	Student will be able to	Student will calculate the	Student will understand the principle	Students will understand the theory
CE-C304	Engineering Geology	Student apply the core concepts	Students can gain the	Students identify various minerals and	Students gain knowledge structural
CE-C305	Fluid Mechanics I	Students understand Properties of fluid and basic concepts applicable to fluid mechanics	Students will solve problems on Pascal's law, hydrostatic law and determination of Hydrostatic pressure and Centre of pressure.	Students apply the concepts of buoyancy, Metacenter, metacentric height and liquids in relative equilibrium.	Students understand the concepts of ideal fluid flow and fluid kinematics.
CE-C306	Building Material	Students understand various	Students study the	Students study the classification,	Students understand types of

SEM IV

Course Code	Course Name	CO1	CO2	CO3	CO4
CE-C401	Applied Mathematics IV	Students use matrix algebra with its specific rules to solve the system of linear equations.	Students understand and apply the concept of probability distribution and sampling theory to engineering problems.	Students apply principles of vector differential and integral calculus to the analysis of engineering problems.	Students identify, formulate and solve engineering problems
CE-C405	Concrete Technology	Students study the ingredients of the concrete & Properties of cement & aggregate.	Students study the details of concrete & concreting techniques and to differentiate between properties of fresh and hardened concrete.	Students can design concrete mix by I.S. method.	Students study about the HPC, admixtures and their application.

CE-C402	Surveying II	Students understand the principle, uses and importance of tacheometry.	Students will learn and analyse various methods tacheometry and their application in practical work.	Students understand the various types of curves and able to analysis setting out of horizontal curve.	Students learn analysis of setting out of vertical curves & works with suitable methods.
CE-C404	Building Design And Drawing- I	Students will get an idea of load bearing, framed and Composite structure.	Students understand the concept of footing, types of footing, Doors, windows and stair-case	Students will be able to plan the building as per the bye laws and sun path diagram and able to execute the plan onto the field.	Students understand various terminologies of building drawing and local district rules and can draw the plan, elevation, section of the building.
CE-C406	Fluid Mechanics- II	Students get familiar with concepts of major and minor losses due to various pipe fittings.	Students get familiar with concepts of major and minor losses due to various pipe fittings.	Students will be able to evaluate pressure drop in pipe flow using hagen-poiseuille's equation for laminar flow in a pipe.	Students do understand the concept of Prandtl's mixing theory and solve turbulent flow problems.
CE-C403	Structural Analysis- I	Students will be able to draw SFD, AFD and BMD of determinate frame with internal hinge.	Students will be able to find the slope and deflection of beams using these methods	Students will be able to find the deflection and slope in portal frames using Energy methods.	Students get the concept of influence line diagram and can draw influence line for determinate structures.

SEM V

Course Code	Course Name	CO1	CO2	CO3	CO4
CE-C502	Geotechnical Engineering- I	Students understand properties of soil and also able to understand interrelationship between soil properties	Students will be able to understand and analyse particle size and plasticity characteristic and also able to classify the soil	Students will learn to calculate phenomenon such as permeability and seepage	Students will understand principle stress and shear strength developed in soil
CE-C503	Building Design & Drawing- II	Students learn and understand the planning concepts, rules, regulations, various types of authorities for public building.	Students get knowledge and able to draw one point & two point perspective drawings for public buildings.	Students learn to understand redevelopment concept and residential planning	Students get familiar with objective and principles of town planning.
CE-C504	Applied Hydraulics- I	Students able to understood the momentum principle, moment of momentum equation and applications of hydraulic machines	Students able to understand the significance of dimensionless numbers, concept of dimensional homogeneity and different types of model laws and their applications	Students able to determine force exerted on stationary flat plates which held normal and vertical to jet and also for curved plate.	Students able to understand about the general layout, working procedure of hydro electric plates and calculations of efficiencies for different turbines

CE-C501	Structural Analysis- II	Students identify stable, unstable, determinate and indeterminate structures.	Students will be able to determine the deflection of determinate structures due to temperatures effect & settlement.	Students will analyse the indeterminate structures by force methods.	Students can analyse the indeterminate structures by displacement methods.
CE-C505	Transportation Engineering- I	Students will be able to understand the elements of Air Transportation such as terminal building, parking facilities, apron, hangars, markings and lightings, airport drainage, ATC etc.	Students able to design the airport elements such as runway orientation, length, gate and taxiway.	Students able to understand elements of water transportation like harbours, ports and breakwater including study of facilities and equipment's used.	Students will be able to decide the Cross Section of the Permanent way and suggest suitable ballast, sleepers, rail and their fixtures and fasteners.

SEM VI

Course Code	Course Name	CO1	CO2	CO3	CO4
CE-C601	Geotechnical Engineering - II	Students understand concept of stability of slope and study various method of evaluating stability of slope.	Students will be able to understand lateral earth pressure theories and method to calculate active and passive earth pressure also able to check stability of retaining structure	Students will be able to calculate bearing capacity to design various footing such as square, rectangle etc.	Students will be able to understand necessity of pile foundation and also able to design and calculate load on pile.
CE-C605	Environmental Engineering- I	Students will understand the importance of sanitation. They will also learn to estimate water demand using population forecasting methods.	Students will learn to give layout of distribution system which is suitable for particular location.	Students get idea about whole water treatment process and will be able to design sedimentation tank and rapid sand filter.	Students get the idea about different coagulants, disinfectant, iron removal, defluoridation, Reverse osmosis and hardness removing methods.
CE-C603	Applied Hydraulics- II	Students will understand the boundary layer theory and boundary layer separation on the submerged bodies.	Students will understand the impact of engineering solutions for boundary layer theory in the context of submerged bodies.	Students will develop the understanding of the flow phenomena and parameters in channel section.	Students shall design most efficient channel section.
CE-C602	Design & Drawing Of Steel Structures	Students get the idea of the properties of steel and working stress method & limit state method.	Students will be able to design of simple connections and bracket connections with bolted & welded.	Students get the idea about failures of tension member and design of tension member.	Students get the idea about failures of compression member and design of compression member as strut & column.
CE-C606	Theory Of Reinforced And Prestressed Concrete	Students will understand the concept of reinforced concrete & working stress method (WSM).	Students will analyse & design various types of beams& columns by WSM.	Students will design slab, footing & shear bonds in structure by WSM.	Students will understand basic principles, methods, losses & analysis of prestressed concrete.

CE-C604	Transportation Engineering- II	Students will be able to understand to Design geometric elements of pavements	Students will be able to provide suitable design based on available material and its characteristics and apply construction techniques	Students will be able to understand the drainage system and their role in preventing failure	Students will be able to carryout functional and structural evaluation and thereby applying techniques to strengthen the distressed pavement.
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SEM VII

Course Code	Course Name	CO1	CO2	CO3	CO4
CE-C702	Quantity Survey, Estimation & Valuation	Students can read, understand and interpret plans, sections, detailed drawings and specifications for a construction project. To study the various methods of detailed and approximate estimates	Students will be able to emphasize the importance of relevant IS: 1200- 1964 codes and relevant Indian Standard specifications, taking out quantities from the given requirements of the work, and drafting specifications.	Students can conduct a material and labour survey to understand the current market rates for the various materials required for construction and the different categories of labour required. To prepare specifications of various types, prepare specifications for various items as a part of tender documents. Understanding the importance and use of specification.	Students will be able to perform the rate analysis for various items: standard and non-standard and the use of DSR in this process.
CE-C704	ENVIRONMENTAL ENGINEERING II	Students will be able to determine quantity of waste water and also design the sewer line for a population of particular city	Students will analyse waste water sample and suggest a suitable solution to remove the impurities from water.	Students get the idea about working and design of secondary treatment units and sludge disposal standards.	Student get the idea about advanced water treatment used for removal of nutrients from waste water and how to calculate oxygen deficit.
CE-C703	IRRIGATION ENGINEERING	Students will be able collect data and calculate the demand of water for agricultural land.	Students will be able to derive hydrographs and predict yield of catchment.	Students can apply their knowledge on ground water, well hydraulics to estimate safe yield.	Students will be able to investigate and control level of sedimentation in reservoir.
CE-C701	LIMIT STATE METHOD FOR REINFORCED CONCRERE STRUCTURE	Students will develop the clear understanding of the concepts of the design of reinforced concrete structure using ULM and LSM.	Students will understand the concept of ULM and apply it in analysis and design of beams.	Students will understand the various clauses of IS: 456-2000 and its significance in the RCC design.	Students will independently or as a member of the team design structural member like beam, column, slab and footing by using LSM.
CE-C705	Traffic Engineering & Control	Students will understand the all the traffic characteristics such as speed, journey time, hydrodynamic analogies, queuing theory and entropy in traffic engineering.	Students will understand all the traffic surveys such as O&D, Parking, Accident etc. required for effective traffic management system and to correlate the concepts related to highway capacity.	Students will understand, plan and design all the important elements on the roads like signal, rotary, traffic management systems and street lighting.	Students will apply statistical analysis in traffic engineering
CE-C705	SOLID WASTE MANAGEMENT	Students will be able to understand generation, characteristics and functional elements of municipal solid waste.	Students will understand study segregation of municipal solid waste and collection, storage and transportation methods of waste	Students will be able to distinguish different types of waste processing techniques and disposal methods	Students study different types of solid waste including its generation, classification, collection, storage, transportation and disposal

CE-C705	Advace Structural Analysis	Students will be able to understand stiffness matrix method.	Students will analyse various types of structures by conventional form of stiffness method, Modified Moment Method, Kani's Method.	Students will be able to understand Flexibility Method in Matrix form.	Students will analyse the indeterminate structure by conventional form of flexibility method.
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SEM VIII

Course Code	Course Name	CO1	CO2	CO3	CO4
CE-C801	Design And Drawing Of Reinforced Concrete Structures	Students will understand the complete analysis and design of residential and industrial buildings using relevant IS codes.	Students will understand the complete analysis and design of different types of retaining walls.	Students will understand the complete analysis and design of different types of water tanks using relevant IS codes by working stress method.	Students be well versed with concepts of civil engineering techniques and ability to use it in practice
CE-C802	Construction Engineering	Students will understand the different types of standard/special equipment used in the construction industry and learn the different sources of equipment, economic life and depreciation cost of equipment.	Students will be able to determine owning and operating costs, evaluate maintenance and repair costs.	Students will understand the various equipment related to earth moving, drilling and blasting, pile driving, pumping, stone crushing, air compressors, equipment for moving materials etc.	Students will understand the complex processes involved in the construction of tunnels.
CE-C803	Construction Management	Students will be able to understand and apply Management principles, its significance to Construction Management and managing resources. They can also plan, schedule, execute and control projects effectively using resources.	Students will know the unique features, life cycle of project. Understanding the roles and responsibilities of the agencies involved. It gives an idea about organizing and mobilizing resources, design an effective layout etc.	Students will be able to demonstrate capability for preparing project networks and work out best possible project duration. Students shall be able to draw bar charts, for different stages of Planning. Analyse Network to find Critical Path. Use PERT method for particular projects, deducing time estimates and finding slack. Finding, the probability of project completion time using statistical tools.	Students will be able to implement Materials Management, the methods used for inventory control. They get an idea of Manpower planning, selection & recruitment, training, performance evaluation. Understand basics of Finance management, sources of funds, their pros & cons based on project economic appraisal. Students learn the method of Resource levelling and Resource smoothing. Students get a basic introduction to Project management software.
CE-C804	Transportation Planning And Economics	Students will be able to understand and apply Land use transport models for transportation planning. They will also be able to understand travel forecasting principles and techniques in planning.	Students get to understand the various cost and benefit related to transport project. And they will also be able to compare feasibility of projects using net present value and rate of return from projects.	Students will be able to compare characteristics and application of various mass rapid transit system used in urban transportation	

CE-C804	Industrial Waste Treatment	Students will understand and get the idea of various characteristics of different industrial wastewater, river and effluent standards and sampling and analysis of industrial waste.	Students will understand process of self-purification of streams, the significance of Streeter and Phelp's equation and Oxygen Sag Curve.	Students get acquainted with unit process and unit operations like neutralization, equalization etc.	Students will identify effluent characteristics of Industrial waste on the basis of manufacturing process and effluent treatment of Industrial waste on the basis of manufacturing process.
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CMPN (UG)

SEM	SUBJECT	CODE	STATEMENTS
III	Applied Mathematics III	CSC 301.1	Understand complex variable theory, application of harmonic conjugate to get orthogonal trajectories and analytic function.
		CSC 301.2	Plot the image of the curve by a complex transformation from z-plane to w-plane.
		CSC 301.3	Expand the periodic function by using Fourier series and complex form of Fourier series.
		CSC 301.4	Understand the concept of Laplace transform and inverse Laplace transform of various functions and its application to solve ordinary differential equations.
		CSC 301.5	Apply the concept of Z- transformation and its inverse of the given sequence.
		CSC 301.6	Apply the concept of Correlation and Regression to the engineering problems.
	Digital Logic Design and Analysis	CSC 302.1	To understand different number systems and their conversions.
		CSC 302.2	To analyze and minimize Boolean expressions.
		CSC 302.3	To design and analyze combinational circuits.
		CSC 302.4	To design and analyze sequential circuits
		CSC 302.5	To understand the basic concepts of VHDL.
		CSC 302.6	To study basics of TTL and CMOS Logic families.
	Discrete Mathematics (DIM)	CSC303.1	Understand the notion of mathematical thinking, mathematical proofs and to apply them in problem solving.
		CSC303.2	Ability to reason logically.
		CSC303.3	Ability to understand relations, Diagraph and lattice.
		CSC303.4	Ability to understand use of functions, graphs and their use in programming applications.
		CSC303.5	Understand use of groups and codes in Encoding-Decoding
		CSC303.6	Apply discrete structures into other computing problems such as formal specification, verification, artificial intelligence, cryptography, Data Analysis and Data Mining etc.
	Electronic Circuits and Communication Fundamentals (ECCF)	CSC304.1	To understand the use of semiconductor devices in circuits and analyze them.
		CSC304.2	To understand importance of oscillators and power amplifiers in communication system.
		CSC304.3	To understand basic concepts of operational amplifier and their applications.
		CSC304.4	To understand the fundamental concepts of electronic communication
		CSC304.5	To apply knowledge of electronic devices and circuits to communication applications.
		CSC304.6	To study basic concepts of information theory.
	Data Structures (DS)	CSC 305.1	Students will be able to implement various linear and nonlinear data structures.
		CSC 305.2	Students will be able to handle operations like insertion, deletion, searching and traversing on various data structures.
		CSC 305.3	Students will be able to select appropriate sorting technique for given problem.
		CSC 305.4	Students will be able to select appropriate searching technique for given problem.
		CSC 305.5	Students will be able to apply the learned concepts in various domains like DBMS and Compiler Construction.
		CSC 305.6	Students will be able to choose appropriate data structure for specified problem domain.
Digital System Lab	CSL 301.1	Understand the basics of various digital components.	
	CSL 302.2	Understand the principles of design of combinational logic and sequential logic circuits using basic components.	
	CSL 303.3	Recognize the importance of digital systems in computer architecture.	
	CSL 303.4	Design and simulate the basic digital circuit.	
Basic Electronics Lab	CSL 302.1	Understand the basics of various semiconductor devices, electronic components and instruments.	
	CSL 302.2	Understand the working of electronic circuits using components	
	CSL 302.3	Recognize the importance of electronic circuits in electronic communications.	
	CSL 302.4	Study the fundamental concepts of various modulation methods	

	Data structure Lab	CSL 303.1	Students will be able to implement various linear and nonlinear data structures.
		CSL 303.2	Students will be able to handle operations like insertion, deletion, searching and traversing on various data structures.
	OOPM(Java) Lab	CSL 304.1	To apply fundamental programming constructs.
		CSL 304.2	To illustrate the concept of packages, classes and objects.
		CSL 304.3	To elaborate the concept of strings, arrays and vectors.
		CSL 304.4	To implement the concept of inheritance and interfaces.
		CSL 304.5	To implement the notion of exception handling and multithreading.
		CSL 304.6	To develop GUI based application.
IV	Applied Mathematics IV	CSC 401.1	Students in this course will be able to apply the method of solving complex integration, computing residues & evaluate various contour integrals.
		CSC 401.2	Demonstrate ability to manipulate matrices and compute Eigen values and Eigen vectors.
		CSC 401.3	Apply the concept of probability distribution to the engineering problems.
		CSC 401.4	Apply the concept of sampling theory to the engineering problems.
		CSC 401.5	Use matrix algebra with its specific rules to solve the system of linear equation, using concept of Eigen value and Eigen vector to the engineering problems.
		CSC 401.6	Apply the concept of Linear & Non-Linear Programming Problem to the engineering problems.
	Analysis of Algorithm (AOA)	CSC 402.1	Analyze the running time and space complexity of algorithms.
		CSC 402.2	Describe, apply and analyze the complexity of divide and conquer strategy.
		CSC 402.3	Describe, apply and analyze the complexity of greedy strategy.
		CSC 402.4	Describe, apply and analyze the complexity of dynamic programming strategy.
		CSC 402.5	Explain and apply backtracking, branch and bound and string matching techniques to deal with some hard problems.
		CSC 402.6	Describe the classes P, NP, and NP-Complete and be able to prove that a certain problem is NP-Complete.
	Computer Organization and Architecture (COA)	CSC 403.1	To describe basic structure of the computer system.
		CSC 403.2	To demonstrate the arithmetic algorithms for solving ALU operations.
		CSC 403.3	To describe instruction level parallelism and hazards in typical processor pipelines.
		CSC 403.4	To describe superscalar architectures, multi-core architecture and their advantages
		CSC 403.5	To demonstrate the memory mapping techniques.
		CSC 403.6	To Identify various types of buses, interrupts and I/O operations in a computer system
	Computer Graphics (CG)	CSC 404.1	Understand the basic concepts of Computer Graphics.
		CSC 404.2	Demonstrate various algorithms for scan conversion and filling of basic objects and their comparative analysis.
		CSC 404.3	Apply geometric transformations, viewing and clipping on graphical objects.
		CSC 404.4	Explore solid model representation techniques and projections.
		CSC 404.5	Understand visible surface detection techniques and illumination models.
	Operating System (OS)	CSC 405.1	Understand role of Operating System in terms of process, memory, file and I/O management.
		CSC 405.1	Apply and analyse the concept of a process, thread, mutual exclusion and deadlock.
		CSC 405.1	Evaluate performance of process scheduling algorithms and IPC.
		CSC 405.1	Apply and analyse the concepts of memory management techniques.
		CSC 405.1	Evaluate the performance of memory allocation and replacement techniques.
	Analysis of Algorithms	CSL 401.1	Analyze the complexities of various problems in different domains.
		CSL 401.2	Prove the correctness and analyze the running time of the basic algorithms for those classic problems in various domains.

Lab	CSL 401.3	Develop the efficient algorithms for the new problem with suitable designing techniques.	
	CSL 401.4	Implement the algorithms using different strategies.	
Computer Graphics Lab	CSL 402.1	Explore the working principle, utility of various input/ output devices and graphical tools.	
	CSL 402.2	Implement various output and filled area primitive algorithms using C/ OpenGL	
	CSL 402.3	Apply transformation and clipping algorithms on graphical objects.	
	CSL 402.4	Implementation of curve and fractal generation.	
	CSL 402.5	Develop a Graphical application based on learned concept.	
Processor Architecture Lab	CSL 403.1	Assemble personal computer	
	CSL 403.2	Design the basic building blocks of a computer: arithmetic-logic unit, registers, central processing unit, and memory.	
	CSL 403.3	Implement various instructions and operations.	
	CSL 403.4	Describe various I/O buses with merits and demerits.	
Operating System Lab	CSL 404.1	Understand basic operating system commands.	
	CSL 404.2	Understand and explore various system calls.	
	CSL 404.3	Write shell scripts and shell commands using kernel APIs.	
	CSL 404.4	Implement and analyze different process scheduling algorithms	
	CSL 404.5	Implement and analyze different memory management algorithms.	
	CSL 404.6	Evaluate process management techniques and deadlock handling using simulator.	
Open Source Tech Lab	CSL 405.1	To understand basic concepts in python and perl.	
	CSL 405.2	To explore contents of files, directories and text processing with python	
	CSL 405.3	To develop program for data structure using built in functions in python.	
	CSL 405.4	To explore django web framework for developing python based web application.	
	CSL 405.5	To understand file handling and database handling using perl.	
	CSL 405.6	To explore basics of two way communication between client and server using python and perl.	
V	Microprocessor (MP)	CSC 501.1	Use TASM to develop assembly language program.
		CSC 501.2	Design 8086 based microprocessor system.
		CSC 501.3	Demonstrate the new protection mechanism and superscalar architecture.
		CSC 501.4	Choose processor with appropriate architecture.
		CSC 501.5	Compare between multicore processors.
	Operating System (OS)	CSC 502.1	Identify different functions or services provided by general operating system.
		CSC 502.2	Demonstrate scheduling algorithms like FCFS, SJF, priority and RR on various processes.
		CSC 502.3	Compare different disk scheduling algorithms.
		CSC 502.4	Choose appropriate solution if deadlock occurs.
	Structured and Object Oriented Analysis and Design (SOOAD)	CSC 503.1	Identify Requirements for a software system.
		CSC 503.2	Prepare the system Proposal for Software System.
		CSC 503.3	Develop and Document DFD for the required software systems.
		CSC 503.4	Design different diagrams using Object oriented approach.
		CSC 503.5	Design a database and user interface for any given software System.
	Computer Networks (CN)	CSC 504.1	Understand the functionalities of each layer in network architecture.
		CSC 504.2	Understand the significance of protocol and the issues that are addressed.
		CSC 504.3	Identify the configurations for a router and analyse the protocols in network.

		CSC 504.4	Understand the significance of network management and related issues.
	Business Communication and Ethics (BCE)	CPL 502.1	Participate and contribute your views confidently during group discussions, meetings and interviews.
		CPL 502.2	Design slides and your style of presentations has improved.
		CPL 502.3	Understand the importance of effective interpersonal skills and professional ethics & etiquettes in life & career.
		CPL 502.4	Draft reports and proposals.
VI	System Programming and Compiler Construction (SPCC)	CPC 601.1	Compare different types of system software.
		CPC 601.2	Use of different tool for translation of program from user friendly environment to system specific commands.
		CPC 601.3	Analyse number of phases, determine number of passes and compare different implementation.
		CPC 601.4	Develop LEX/ YACC tool based on rules of the software (such as RE, CFL).
		CPC 601.5	Apply optimization principles on given code.
		CPC 601.6	Prepare macros, which are required to improve readability and productivity.
	Software Engineering (SE)	CPC 602.1	Develop and estimate and schedule for required software project.
		CPC 602.2	Identify and assess different risks in the software project.
		CPC 602.3	Design and develop high Quality software Application.
		CPC 602.4	Test and validate the developed projects for quality.
	Distributed Database (DDBMS)	CPC 603.1	Analyse the business requirements and Propose a conceptual Distributed DB Design.
		CPC 603.2	Revise the DB Design by applying the Distributed concepts.
		CPC 603.3	Implement the distributed database design using the concept of fragmentation and replication.
		CPC 603.4	Formulate the queries to Fetch/Update the data on multiple sites.
		CPC 603.5	Estimating the cost of distributed Queries by converting it in to algebraic form.
		CPC 603.6	Compare different deadlock methods and concurrency control techniques.
	Mobile Communication and Computin (MCC)	CPC 604.1	Explain GSM and CDMA cellular architecture.
		CPC 604.2	Categorize the functions of communication system for TCP/IP layers.
		CPC 604.3	Correlate TCP/IP stack with the wireless stack.
		CPC 604.4	Develop Mobile applications using J2ME, Android and WML Platforms.
		CPC 604.5	Evaluate and test various wireless networks and protocols using open source simulation tools like NS2.
	Software Project Management (SPM)	CPC 6012.1	Define and describe their basic knowledge in Software Project management.
		CPC 6012.2	Identify and apply the key phases of Software project management to solve real time systems.
		CPC 6012.3	Evaluate software project for closure.
		CPC 6012.4	Design project plan, risk mitigation plan, various reports and system diagrams for the Software Project in a group.
		CPC 6012.5	Demonstrate their software project management ideas in front of group and peers.
	Germal Language (GL)	CPC 6013.1	Read and understand simple German Text.
		CPC 6013.2	Describe basic family structure and work culture.
		CPC 6013.3	Draft e-mails and create simple presentations.
		CPC 6013.5	Culturally and socially attuned to the European civilization.
	Operation Research		
	Networking Programming Laboratory (NPL)	CPL 601.1	Understand and implement the basic networking commands.
CPL 601.2		Configure Linux router and edit routing tables.	
CPL 601.3		Develop networking projects.	
CPL 601.4		Design a network with FTP, WEB and DNS server.	

		CPL 601.5	Designing TCP, UDP, Iterative and Concurrent Client-Server Programming.
VII	Digital Signal Processing (DSP)	CPC701.1	Understand the concept of Discrete Time signals and demonstrate signal manipulation by applying those concepts.
		CPC701.2	Perform time domain analysis of various DT systems.
		CPC701.3	Analyze system using various FFT flow-graphs and Fast DSP algorithms.
		CPC701.4	Design systems for Real Time Signal Processing Applications using DSP.
		CPC701.5	Solve real world engineering problems by applying DSP concepts.
	Cryptography and System Security (CSS)	CPC702.1	Describe security goals, threats and vulnerabilities.
		CPC702.2	Describe various cryptography and authentication techniques.
		CPC702.3	Choose appropriate solution to specific security challenges.
		CPC702.4	Implement the cryptographic algorithms.
	Artificial Intelligence (AI)	CPC703.1	Understand structure of Agents.
		CPC703.2	Understand about searching technique.
		CPC703.3	Use quantifier operators.
		CPC703.4	Familiar with block world problem.
		CPC703.5	Understand decision tree.
	Soft Computing (SC)	CPE7042X.1	Describe soft computing techniques and their roles in building intelligent machines.
		CPE7042X.2	Demonstrate fuzzy logic and reasoning to handle uncertainty and solve engineering problems.
		CPE7042X.3	Compare different learning types and understand their uses for training the neural network.
		CPE7042X.4	Capable of designing problems using genetic algorithm.
	Enterprise Resource Planning and Supply Chain Management (ERP SCM)	CPE7042X.1	Describe the technologies behind ERP and SCM for an organization.
		CPE7042X.2	Analyse mathematical model of SCM.
		CPE7042X.3	Identify implementation strategy for ERP and SCM.
		CPE7042X.4	Use the open source tool for integrating the business modules required for an ERP system.
	Image Processing (IP)	CPE7042X.1	Understand the basic concepts of Digital Image processing.
		CPE7042X.2	Explain image enhancement and Segmentation techniques.
		CPE7042X.3	Develop fast image transform flowgraph.
CPE7042X.4		Solve Image compression and decompression.	
CPE7042X.5		Perform various binary morphological image operations.	
Networks Threats and Attacks Laboratory (NTAL)	CPL701.1	Use the network analysis commands and tools like nmap , wireshark to analyse the network , website or domain.	
	CPL701.2	Prevent any system from spoofing attack or buffer overflow attack using tools like arpwatc.	
	CPL701.3	Identify and fetch proper solution for the vulnerability of your network using nessus.	
	CPL701.4	Install and use SNORT for Detecting Intrusion.	
	CPL701.4	Define rules using iptables to set up firewall.	
	Data Warehouse and Mining (DWM)	CPC801.1	Understand and implement classical algorithms in Data mining.
		CPC801.2	Identify strengths and weaknesses of algorithms learned and will be able to utilize for solving real world problems.
		CPC801.3	Learn Data Mining techniques as well as methods for integrating & interpreting the data sets.
		CPC801.4	Apply knowledge gained in Data ware Housing to improve effectiveness and efficiency of data analysis.
	Human Machine	CPC802.1	Stress the importance of a good interface design.
		CPC802.2	Understand the importance of human psychology in designing good interfaces.

VIII	Human Machine Interaction (HMI)	CPC802.3	Apply HMI in their day – to – day activities.
		CPC802.4	Build innovative applications that are user friendly.
		CPC802.5	Indulge into research in Machine Interface Design.
	Parallel and Distributed Systems (PDS)	CPC803.1	Apply the principles and concept in analysing and designing the parallel and distributed system.
		CPC803.2	Reason about ways to parallelize problems.
		CPC803.3	Gain an appreciation on the challenges and opportunities faced by parallel and distributed systems.
		CPC803.4	Understand the middleware technologies that support distributed applications such as RPC, RMI and object based middleware.
	Digital Forensic (DF)	CPC803.5	Improve the performance and reliability of distributed and parallel programs.
		CPP803X.1	Select the procedures for identification, preservation and extraction of electric evidence, auditing and investigation of network and host system intrusions, analysis and documentation of information gathered, and preparation of expert testimonial evidence.
		CPP803X.2	Classify the different types of digital evidences.
		CPP803X.3	Apply various forensic tools and resources for system administrators and information system security officers.
	Big Data Analytics (BDA)	CPP803X.4	Determine various cybercrime and its preventions methods.
		CPP803X.1	Understand the key issues in big data management and its associated applications in intelligent business and scientific computing.
		CPP803X.2	Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics.
		CPP803X.3	Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.
	Machine Learning (ML)	CPP803X.4	Achieve adequate perspectives of big data analytics in various applications like recommender systems, social media applications.
		CPP803X.1	Understand Machine learning techniques.
		CPP803X.2	Identify strengths and weaknesses of regression, classification and clustering algorithms.
		CPP803X.3	Learn Supervised and unsupervised learning.
		CPP803X.4	Apply dimensionality reduction techniques to improve effectiveness and efficiency of data analysis.
Cloud Computing Laboratory (CCL)	CPP803X.5	Understand Viterbi algorithm.	
	CPL801.1	Appreciate cloud architecture.	
	CPL801.2	Create and run virtual machine on open source OS.	
	CPL801.3	Implement infrastructure, storage as service.	
		CPL801.4	Install and appreciate security features for cloud.

Sem III

Course Code	Course Name	CO1	CO2	CO3	CO4
At the end of the course student will able to:					
CSC301	Applied Mathematics III	Understand complex variable theory, application of harmonic conjugate to get orthogonal trajectories and analytic function.	Plot the image of the curve by a complex transformation from z-plane to w-plane.	Expand the periodic function by using Fourier series and complex form of Fourier series lema's	Understand the concept of Laplace transform and inverse Laplace transform of various functions and its application to solve ordinary differential equations.
CSC302	Object Oriented Programming Methodolgy	Understand features and concepts of object oriented programming.	Solve various computational problems using constructs such as if-else.	Understand the concepts of classes and objects in detail.	Understand the importance of interfaces and classes.
CSC303	Data Structures	Study different data structures.	Implement different operations on stack and queue.	Implement different operations on Link list.	Implement different operations on trees.
CSC304	Digital Logic Design and Analysis	Understand different number systems and their conversions	Analyze and minimize Boolean expressions.	Design and analyze combinational circuits.	Design and analyze sequential circuits
CSC305	Discrete Structures	reason logically.	understand use of functions, graphs and trees in programming applications.	understand use of groups and codes in Encoding-Decoding..	express recursive functions of other subjects like Data Structures as recurrence relation.
CSC306	Electronic Circuits and Communication Fundamentals	understand the use of semiconductor devices in circuits and modify it as per requirement	understand the significance of power amplifiers in day to day applications along with the importance of oscillators.	understand the basic concepts of operational amplifier along with its application.	understand the fundamentals of electronic communication and its application.

Sem IV

Course Code	Course Name	CO1	CO2	CO3	CO4
At the end of the course student will able to:					
CSC401	Applied Mathematics IV	Apply the concept of Line Integral and Taylors Laurent's with Region Of Convergence in Engineering Problems.	Apply the concepts of Matrices with Cayley Hamilton Theorem in Engineering problems	Apply the concept Of Probability With Moments and P.d.f in Engineering Problems.	Applythe Concept Of Large Sample Test and Hypothesis in Solving Engineering Problems.
CSC402	Analysis of Algorithms	calculate time complexity and space complexity of an algorithm	analyze different divide and conquer problems	analyze different greedy method problems.	analyze different dynamic programming problems
CSC403	Computer Organization and Architecture	understand basic structure of computer.	perform computer arithmetic operations.	Ability to understand control unit operations.	design memory organization that uses banks for different word size operations.
CSC404	Data Base Management systems	have the ability to reason logically.	understand use of functions, graphs and trees in programming applications.	understand use of groups and codes in Encoding-Decoding..	express recursive functions of other subjects like Data Structures as recurrence relation.
CSC405	Theoretical Computer Science	Get a conceptual understanding of the fundamentals of alphabets ,grammar languages.	Develop an understanding of different types of turing machines and their applications.	Classify and differentiate between the power and limitations of theoretical models of computations.	Grasp the design of basic machines.regular expressions,deterministic and non deterministic machines.
CSC406	Computer Graphics	Understood basic concepts of computer graphics	Acquired knowledge about drawing basic shapes such as lines, circle ellipse.	Got basic knowledge of windowing and clipping.	Acquired knowledge about Illumination Models and Surface Rendering

Sem V

Course Code	Course Name	CO1	CO2	CO3	CO4
At the end of the course student will able to:					

CPC501	Microprocessor	Understand Processor Architecture.	Create assembly language and mixed language programs for 8086 based system.	Design system using memory chips and peripheral chips for 8086 microprocessor	Illustrate techniques to improve performance of microprocessors.
CPC502	Operating Systems	Understand basic knowledge, functions and services of Operating system as system software	Design functions and services and learn various scheduling algorithms.	Identify the role of process synchronization towards increasing throughput of the system	Solve the deadlock problems, resource allocation and apply various techniques.
CPC503	Structured and Object Oriented Analysis and Design	understand and apply Techniques to get the System Requirements.	understand and present System Requirement in standard format	understand and Analyse Feasibility for System Requirements.	understand and Model different System Requirements.
CPC504	Computer Networks	develop an understanding of computer network, protocol, topology and the concept of OSI layers.	conceptual understanding of the guided and unguided media.	understand Flow control, error control, framing With the aloha and CSMA.	understand the concept of Iv4 and IPv6 addresses, subletting with the routing algorithm.
CPC501	Web Technologies	design static web page using HTML tags.	make web pages more attractive using css and interactive using forms.	develop a dynamic webpage by the use of java script	use web development tool

Sem VI

Course Code	Course Name	CO1	CO2	CO3	CO4
		At the end of the course student will able to:			
CPC601	System Programming and Compiler Construction	Understand system program and application program.	Learn the basics of assembler, compiler loader and macroprocessor.	Understand different types of software tools.	Study different phases of compiler.
CPC602	Software Engineering	get a conceptual understanding of the Software engineering, Software processing models and Metrics	develop an understanding of different types of Cost estimation Models and the software scheduling and Planning	develop and understanding of Risk management and software configuration management with version and change control	grasp the design of software and understand the concept of software architecture and user interface design with Software quality assurance and quality metrics
CPC603	Distributed Databases	get the idea of distributed database systems, issues in designing, and architectures of DDB	get the idea about fragmentation, allocation and various transparencies in Distributed Database design	get an idea of transaction management, concurrency control and various algorithms for concurrency control in distributed database.	understand Deadlock detection techniques, prevention, and avoidance and recovery protocols in distributed database systems.
CPC604	Mobile Communication and Computing	Understand GSM and CDMA cellular architecture	Design and configure wireless access points	Use network simulator tool to simulate mobile network.	Implement small android based application.
CPE6011	Project Management	Define characteristics of a project	Conceptualize IT project management	Study and describe risk in environment and the management challenges for effective project management.	Apply the project management principles across all phases of a project

Sem VII

Course Code	Course Name	CO1	CO2	CO3	CO4
		At the end of the course student will able to:			
CPC701	Digital Signal Processing	Understand the concept of Discrete time Signal and perform signal manipulation.	Perform classification of DT System and will be able to understand concept of IIR and FIR System.	Evaluate DFT and analyze the properties of DFT.	Calculate DFT using FFT Flowgraph.

CPC702	Cryptography and System Security	understand a variety of generic security threats and vulnerabilities, identify and analyze particular security problems for a given application	understand the principles and practices of basic and advanced cryptographic techniques and its classifications.	understand the various symmetric key cryptographic techniques, their design and modes of operations along with their applications.	understand the various public key cryptographic techniques, their design and modes of operations along with their applications.
CPC703	Artificial Intelligence	develop a basic understanding of AI building blocks presented in intelligent agents	Understand working of different types of agents and environments.	Solve problems using different search strategies and reasoning and apply different learning algorithms to solve problems	Infer and explain knowledge and reasoning in uncertain domain and different methods of learning.
CPE7042X	Software Architecture	Understand the architectural concepts ,importance and role of software architecture	Recognize major software architectural styles, design patterns and framework	Analyze Components and different types of Connectors ,their role in software architecture	Understand the modeling techniques and types of analysis for a problem and selection among them

Sem VIII

Course Code	Course Name	CO1	CO2	CO3	CO4
At the end of the course student will able to:					
CPC801	Data Warehouse and Mining	Get an idea of designing data warehouse for a given organization	Extract meaningful data from large database	Understand the concepts of applying and implementing algorithms	Identify which algorithm to use for efficient results
CPC802	Human Machine Interaction	Knowledge of basic building blocks of human machine interaction	design user centric interfaces.	design innovative and user friendly interfaces.	apply HMI in their day-to-day activities.
CPC803	Parallel and distributed Systems	Apply the principles and concept in analyzing and designing the parallel and distributed system	Gain knowledge on the challenges and opportunities faced by parallel and distributed systems.	Understand the middleware technologies that support distributed applications such as RPC, RMI and object based middleware.	Improve the performance and reliability of distributed and parallel programs.
CPE803X	Digital Forensic	understand the basic definitions and focus on the procedures for identification, preservation and extraction of electronic evidences and the evidence gathering methodology	focus on the auditing and investigation of network and host based evidences.	analyze and document the information gathered and prepare a testimonial evidence and also analyze the challenges in evidence handling.	experience a hands-on environment of forensic tools and resources.

Course outcomes for Various subjects in Academic Year 2022-23

Name of the Undergraduate Program: **Electrical Engineering**

Term: January 2023 to April 2023

Sr	Name of the Subject	CO	Statement
1	Engineering Mathematics-IV EEC401	CO1	Use the concepts of Complex Integration for evaluating integrals, computing residues & evaluate various contour integrals.
		CO2	Demonstrate the use of Correlation and Regression to the engineering problems in data science, machine learning and AI.
		CO3	Illustrate understanding of the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.
		CO4	Apply the concept of vector spaces and orthogonalization process in Engineering Problems.
		CO5	Use the concept of Quadratic forms and Singular value decomposition in various Engineering applications.
		CO6	Find the extremals of the functional using the concept of Calculus of variation.
2	Electrical AC Machines - I EEC402	CO1	Illustrate working principle and performance of single phase transformer under different operating conditions
		CO2	Explain working principle of autotransformer.
		CO3	Analyze various types of connections and performance of three phase transformer under various conditions.
		CO4	Demonstrate working principle and evaluate the performance of three phase induction motor under various operating conditions.
		CO5	Exemplify various starting methods and speed control of three phase induction motor.
3	Digital Electronics EEC403	CO1	Perform conversion of various number systems
		CO2	Explain working of logic families and logic gates.
		CO3	Design and implement combinational circuits.
		CO4	Design and implement sequential circuits.
		CO5	Explain the process of Analog to Digital conversion and Digital to Analog conversion.
		CO6	Illustrate the use of PLDs to implement the given logical problem.
4	Power Electronic Devices and Circuits EEC404	CO1	Explain the basic operation and characteristics of Thyristers
		CO2	Explain the basic operation and characteristics of various power semiconductor devices
		CO3	Analyse various controlled rectifiers and their applications.
		CO4	Study and analyse inverter circuits and their applications.
		CO5	Analyse dc to dc converter circuits and their applications.
		CO6	Identify and describe various auxiliary circuits and requirements in power electronics applications.
5	Electric and Hybrid Electric Vehicle EEC405	CO1	Identify and describe the history and evolution of electric & hybrid electric vehicles.
		CO2	Identify and describe the principles of various EV/HEVs drive train topologies.
		CO3	Select electric propulsion system components for EV/HEV drives for the desirable performance and control.
		CO4	Compare and evaluate various energy sources and energy storage components for EV/HEV.
		CO5	Model, analyze and design EV/HEV drive train with energy management strategies.
		CO6	Recognize the need to adapt and engage in operations EV/HEV for sustainable transportation system.

Labs and it's LOS---->

LO

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1	Electrical AC Machine Lab-I EEL401	LO 1	Demonstrate the working principles and types of connections of 1 ϕ and 3 ϕ transformers.
		LO 2	Evaluate the losses in 1 phase transformer using OC and SC test
		LO 3	Analyze the performance of 3 ϕ transformer under various operating conditions.
		LO 4	Evaluate the performance of 3 ϕ induction motor by carrying no load test , blocked rotor test and load test
		LO 5	Illustrate the operation of various type of 3 ϕ induction motor starters.
		LO 6	Illustrate different methods of speed control and braking of 3 ϕ induction motors.
		LO 7	Illustrate different methods of speed control and braking of 3 ϕ induction motors.
2	Python Programming Lab EEL402	LO 1	Describe the numbers, Math functions, Strings, List, Tuples and Dictionaries in Python
		LO 2	2. Express different Decision Making statements and Functions
		LO 3	3. Illustrate the skill of object oriented programming in Python to develop applications in electrical engineering
		LO 4	4. Understand different File handling operations
		LO 5	5. Understand the design of GUI Applications in Python and evaluate different database operations
3	Electronics Lab II EEL403	LO1	Use various digital logic Gates, flip-flops and counters for various applications
		LO2	Build, design and analyse sequential / combinational circuits.
		LO3	Understand the operation various power electronics devices and circuits
		LO4	Use power converters for various real life applications
		LO5	Realize the implementation of digital interface with power electronics converters
4	Skill Based Lab- II PCB Design and Fabrication Lab EEL404	LO1	Understand types of PCBs and various tools used for PCB design.
		LO2	Identify various electrical/electronic components and their packages/ footprints.
		LO3	Illustrate the use of PCB CAD tools and their features for the practical designs.
		LO4	Design the schematic, board layout for simple, moderately complex and complex circuits.
		LO5	Fabricate and assemble the PCBs for simple and moderately complex circuits.
Mini-Project 1 B		LO1	Identify problems based on societal /research needs.
		LO2	Apply Knowledge and skill to solve societal problems in a group.
		LO3	Develop interpersonal skills to work as member of a group or leader.
		LO4	Draw the proper inferences from available results through theoretical/experimental/simulations.
		LO5	Analyse the impact of solutions in societal and environmental context for sustainable development.
		LO6	Use standard norms of engineering practices

L07	Excel in written and oral communication.
L08	Demonstrate capabilities of self-learning in a group, which leads to life long learning.
L09	Demonstrate project management principles during project work.

Course outcomes for Various subjects in Academic Year 2022-23

Name of the Undergraduate Program:

Electronics and Telecommunication Engineering

Term: January 2023 to April 2023

Sr	Name of the Subject	CO	Statement
1	ECC601 Electromagnetics and Antenna	CO1	Understand basic radiation mechanism alongwith associated antenna parameters and their applications to wire antennas.
		CO2	Gain the knowledge of need of antenna arrays and associated analysis.
		CO3	Understand the priciple of operation related to various special purpose antennas operating in different frequency bands.
		CO4	Study fundamental principles governing radio wave propagation.
		CO5	Explain the fundamental laws governing electric & magnetic fields and evaluate the associated physical quantities.
		CO6	Analyze and apply Maxwell's equations for various fields and propagation of EM waves through different media.
2	ECC602 Computer Communication Networks	CO1	Analyze network topologies, hardware devices, addressing schemes and the protocol stacks
		CO2	Compare various transmission media and broadband technologies
		CO3	Analyze the flow control, error control and the medium access control techniques
		CO4	Judge network layer addressing and routing schemes
		CO5	Analyze connection oriented and connectionless services
		CO6	Apply the knowledge of application layer protocols
3	ECC603 Image Processing and Machine Vision	CO1	Understand fundamentals of image processing and machine vision
		CO2	Enhance the image quality using spatial and frequency domain techniques for image enhancement
		CO3	Learn image morphology and restoration techniques
		CO4	Represent boundaries and shapes using standard techniques
		CO5	Represent boundaries and shapes using standard techniques
		CO6	Classify the objects using different classification techniques
4	ECC604 Artificial Neural Network and Fuzzy Logic	CO1	Comprehend the concepts of biological neurons and artificial neurons
		CO2	Analyze the feed-forward neural networks and their learning algorithms.
		CO3	Apply unsupervised learning algorithms to train neural network
		CO4	Solve real world complex problems using neural networks
		CO5	Build a simple CNN model and apply in image cassification
		CO6	Analyze the application of fuzzy logic to real world problems.
5	ECCDLO6014 Database Management Systems	LO1	Describe the fundamentals of database Systems.
		LO2	Understand different data models and design issues in database.
		LO3	Design ER diagram, relational Schema and Unified modelling Language
		LO4	Understand the basics model of Relational Algebra, calculus, apply concept of normalization to relational database design
		LO5	Implements Views, Triggers and querying the database using SQL
		LO6	Understand the concepts of Transaction Management, concurrency control, database security and Privacy.
6	ECL601 Electromagnetics and Antenna Lab	LO1	Understand basic radiation mechanism and various antenna parameters.
		LO2	Analyze and compare the various radiation characteristics of wire antennas.
		LO3	Gain the knowledge of need of antenna arrays and associated analysis.
		LO4	Demonstrate knowledge of different aperture antennas in communication systems.
		LO5	Explore operation and design procedure associated with microstrip antennas.
		LO6	Study antenna parameter measurements and basics of wave propagation.
7	ECL602 Computer	LO1	Understand different network topologies
		LO2	Understand different network devices
		LO3	Perform configurations on routers and Ethernet switches
		LO4	Develop knowledge and skills necessary to configure server

	Communication Networks Lab	LO5	Understand the link state routing protocol
		LO6	Understand the inter routing protocol
8	ECL603 Image Processing and Machine Vision Lab	LO1	Understand fundamentals of image processing and machine vision
		LO2	Enhance the quality of image using spatial and frequency domain techniques for image enhancement
		LO3	Perform image morphology and restoration techniques
		LO4	Perform image segmentation techniques based on principle of discontinuity and similarity using various algorithms
		LO5	Classify the object using different classification methods like SVM
		LO6	Apply theoretical knowledge in image processing and machine vision to practical case studies
9	ECL604 Skill Lab: Linux and Networking and Server Configuration	LO1	Install Linux using different platform and execute standard Linux commands.
		LO2	Describe the basic knowledge of Linux Operating System.
		LO3	Deploy the system administrative functionality.
		LO4	Solve the problems using shell script programming.
		LO5	Develop network-based applications.
		LO6	Apply the Linux commands using programming skill to deploy different servers like ftp, telnet etc.
10	ECM601 Mini Project 2B- FPGA based Project	LO1	
		LO2	
		LO3	
		LO4	
		LO5	
		LO6	

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Course outcomes for Various subjects in Academic Year 2022-23

First Year Engineering

Term: January 2023 to April 2023

Name of the Undergraduate Program:

Sr	Name of the Subject	CO	Statement
1	FEC201 Engineering Mathematics-II	CO1	Apply the concepts of First Order and first degree Differential equation to the problems in the field of engineering.
		CO2	Apply the concepts of Higher Order Linear Differential equation to the engineering problems.
		CO3	Apply concepts of Beta and Gamma function to solve improper integrals.
		CO4	Apply concepts of Double integral of different coordinate systems to the engineering problems like area and mass.
		CO5	Apply concepts of triple integral of different coordinate systems to the engineering problems and problems based on volume of solids
		CO6	Solve differential equations and integrations numerically using SCILAB software to experimental aspect of applied mathematics.
2	FEC202 Engineering Physics-II	CO1	Understand diffraction and apply it
		CO2	Explore and Apply concepts from Laser and Fibre Optics for the development of communication technology
		CO3	Understand fundamentals of Electrodynamics
		CO4	Explain fundamentals of relativity
		CO5	Know properties of nanomaterials, tools of characterization and methods of synthesis of nanomaterials
		CO6	Explore basics of sensing techniques for the measurement of physical parameters
3	FEC203 ENGINEERING CHEMISTRY II	CO1	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.
		CO2	Illustrate the concept of emission spectroscopy and describe the phenomena of fluorescence and phosphorescence in relation to it.
		CO3	Explain the concept of electrode potential and nernst theory and relate it to electrochemical cells
		CO4	Identify different types of corrosion and suggest control measures in industries
		CO5	Illustrate the principles of green chemistry and study environmental impact.
		CO6	Explain the knowledge of determining the quality of fuel and quantify the oxygen required for combustion of fuel.
4	FEC 204 ENGINEERING GRAPHICS	CO1	Apply the basic principles of projections in Projection of Lines and Planes
		CO2	Apply the basic principles of projections in Projection of Solids.
		CO3	Apply the basic principles of sectional views in Section of solids.
		CO4	Apply the basic principles of projections in converting 3D view to 2D drawing.
		CO5	Read a given drawing.
		CO6	Visualize an object from the given two views.
5	FEC205 C Programming	CO1	Explain the basics of Computer Systems and C Programming.
		CO2	Explain the control structure mechanisms and branching and looping tools.
		CO3	Create and use C Functions efficiently.
		CO4	Use arrays and string library functions.
		CO5	Explain structure and union concepts and use them to create user defined data types.
		CO6	Use pointers efficiently for referencing and dereferencing.
6	FEC206 PROFESSIONAL COMMUNICATION AND ETHICS-I	CO1	Eliminate barriers and use verbal/non-verbal cues at social and workplace situations
		CO2	Employ listening strategies to comprehend wide-ranging vocabulary, grammatical structures, tone and pronunciation
		CO3	Prepare effectively for speaking at social, academic and business situations
		CO4	Use reading strategies for faster comprehension, summarization and evaluation of texts
		CO5	Acquire effective writing skills for drafting academic, business and technical documents
		CO6	Successfully interact in all kinds of settings, displaying refined grooming and social skills

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1	FEL201 ENGINEERING PHYSICS-II	L01	To determine properties of material and ordinary source using diffraction
		L02	To determine properties of optical fibre
		L03	To study and determine properties of laser and instrument
		L04	Study of photosensors
		L05	Study of Temp. sensors
		L06	Apply concepts in physics to understand physics
2	FEL202 ENGINEERING CHEMISTRY-II	L01	The learner will be able to determine acid value and / or sap value of an oil.
		L02	The learner will be able to determine moisture content of the coal/ and or flash point of oil.
		L03	The learner will be able to determine ash content of the coal.
		L04	The learner will be able to prepare biodiesel / and determine emf of cell.
		L05	
		L06	
3	FEL203 ENGINEERING GRAPHICS	L01	Apply the basic principles of projection in 2D drawings in Engineering Curves
		L02	Apply the basic principles of projections in Projection of Lines and Planes.
		L03	Apply the basic principles of projections in Projection of Solids.
		L04	Apply the basic principles of sectional views in Section of solids.
		L05	Apply the basic principles of projections in drawing different views of a 3D object and also apply basics of principles, to draw the isometric view from the given two views.
		L06	Apply the basic principles of projections in 2D drawings using a CAD software.
4	FEL204 C PROGRAMMING	L01	Writing programs by understanding the basic terminologies, algorithms, flowcharts, data types and operators along with formatted I/O operations.
		L02	Writing programs using conditional, iterative and nested control structures.
		L03	Writing a program using functions.
		L04	Writing sample programs that requires collection-type data such as 1D and 2D Arrays, and strings.
		L05	Writing a sample programs that requires a collection with different types of elements using structures and unions.
		L06	Writing programs to demonstrate pointers.
5	FEL205 PROFESSIONAL COMMUNICATION AND ETHICS-I	L01	Listen and comprehend all types of spoken discourse successfully
		L02	Speak fluently and make effective professional presentations
		L03	Read large quantities of text in a short time to comprehend, summarise and evaluate content
		L04	Draft precise business letters, academic essays and technical guidelines
		L05	Dress finely and conduct themselves with panache in social, academic and professional situation
		L06	
6	FEL206 BASIC WORKSHOP PRACTICE II	L01	Develop the necessary skill required to handle/use different carpentry tools.
		L02	Demonstrate wood turning operations on wood turning machine
		L03	Identify and understand the safe practices to adopt in electrical environment.
		L04	Demonstrate the wiring practices for the connection of simple electrical load/ equipment.
		L05	Develop the necessary skill required to use different sheet metal
		L06	Demonstrate the cutting and bending processes based on sheet metal practices

Course outcomes for Various subjects in Academic Year 2022-23

Name of the Undergraduate Program:

Mechanical Engineering

Term: January 2023 to April 2023

Sr	Name of the Subject	CO	Statement
1	OPC_TH	C01	Illustrate operations functions and manage operations in a better way.
		C02	Apply various strategies to develop aggregate production plan based on the demand forecasting.
		C03	Apply various algorithms in scheduling and sequencing of manufacturing and service operations
		C04	Develop Material Requirements Plans (MRP) to estimate the planned order releases.
		C05	Apply various techniques for facility layout planning and line balancing to optimize the resources
		C06	Demonstrate the importance of implementation of JIT, Lean, Agile and Synchronous manufacturing in manufacturing and
2	CM_TH	C01	Select the type of material for the fibres and matrix in a composite material for the given application.
		C02	Relate stresses and strains through the elastic constants for a given lamina.
		C03	Evaluate elastic properties of a lamina based on the properties of its constituents and predict failure of a lamina under the given loading condition.
		C04	Select the number of laminae and their stacking sequence in a composite material for the given loading condition.
		C05	Identify the type of damage occurring in a composite structure.
		C06	Select an appropriate method to repair the composites.
3	PDD_TH	C01	Describe the process of product design & development
		C02	Generate the concept and and create product architecture
		C03	Identify the customer needs and prapare quality function
		C04	Apply creative thinking and problem solving methods to generate Systematic method of designing
		C05	Preapre industrial design different aspects in industry
		C06	Prapere prototypes using computers and other additive manufacturing techniques
4		C01	
		C02	
		C03	
		C04	
		C05	
		C06	
5		C01	
		C02	
		C03	
		C04	
		C05	
		C06	
6	PDD_LAB	LO1	Understand the basic concepts of engineering design and product design & development in view of identification of need of developing product and impliment it on diffrent products
		LO2	Identify the customer needs and evaluate the same to get design attributes
		LO3	Determine product design specifications to apply design aspects on it
		LO4	Generate concept using creative thinking and avaluate the concepts
		LO5	Study and impliment basisc forms of industrial design, human factors and environmental aspects in design
		LO6	Study and Impliment DFMA in product design
		LO1	Developing & interfacing simple applications using microcontrollers 8051
		LO2	Learn the arduino architecture & Programming

7	IoT_LAB	LO3	Developing simple applications & Interface simple peripheral devices to a Arduino
		LO4	Use microcontroller based embedded platforms in IoT
		LO5	Use wireless peripherals for exchange of data.
		LO6	Setup cloud platform and log sensor data.
8		LO1	
		LO2	
		LO3	
		LO4	
		LO5	
		LO6	
9	Project-II	LO1	Students will be able to implement solutions for the selected problem by applying technical and professional skills
		LO2	Students will be able to analyze impact of solutions in societal and environmental context for sustainable development
		LO3	Students will be able to collaborate best practices along with effective use of modern tools
		LO4	Students will be able to develop clarity of presentation based on written & oral communication.
		LO5	Students will be able to inculcate team,work, leadership skills, professional and ethical behavior.
		LO6	Students will be able to gain expertise that helps in building lifelong learning experience
10		CO 1	
		CO 2	
		CO 3	
		CO 4	
		CO 5	
		CO 6	

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