

Sem	Course Code	Course Name	CO Number	Course Outcome Statements
III	CSC301	Engineering Mathematics - III	CSC3011	Understand the concept of Laplace transform and its application to solve the real integrals in engineering problems.
			CSC3012	Understand the concept of inverse Laplace transform of various functions and its applications in engineering problems.
			CSC3013	Expand the periodic function by using the Fourier series for real-life problems and complex engineering problems.
			CSC3014	Understand complex variable theory, application of harmonic conjugate to get orthogonal trajectories and analytic functions.
			CSC3015	Apply the concept of Correlation and Regression to the engineering problems in data science, machine learning, and AI.
			CSC3016	Understand the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.
III	CSC302	Discrete Structures and Graph Theory	CSC3021	Understand the notion of mathematical thinking, mathematical proofs and to apply them in problem solving.
			CSC3022	Ability to reason logically.
			CSC3023	Ability to understand relations, functions, Diagraph and Lattice.
			CSC3024	Ability to understand and apply concepts of graph theory in solving real world problems.
			CSC3025	Understand use of groups and codes in Encoding-Decoding.
			CSC3026	Analyze a complex computing problem and apply principles of discrete mathematics to identify solutions.
III	CSC303	Data Structure	CSC3031	Explain various data structures, related terminologies and its types.
			CSC3032	Demonstrate the working of various Linear data structures
			CSC3033	Represent & manipulate the data using non-linear data structure
			CSC3034	Select appropriate searching technique for a given problem.
			CSC3035	Recommend the data structures to solve the problems.



			CSC3036	Demonstrate capabilities of self learning which leads to lifelong learning
III	CSC304	Digital Logic & Computer Architecture	CSC3041	Learn different number systems and basic structure of computer system.
			CSC3042	Demonstrate the arithmetic algorithms.
			CSC3043	Understand the basic concepts of digital components and processor organization.
			CSC3044	Understand the generation of control signals of computer.
			CSC3045	Demonstrate the memory organization.
			CSC3046	Describe the concepts of parallel processing and different Buses.
III	CSC305	Computer Graphics	CSC3051	Describe the basic concepts of Computer Graphics.
			CSC3052	Demonstrate various algorithms for basic graphics primitives.
			CSC3053	Apply 2-D geometric transformations on graphical objects.
			CSC3054	Use various clipping algorithms on graphical objects
			CSC3055	Explore 3-D geometric transformations, curve representation techniques and projections methods.
			CSC3056	Explain visible surface detection techniques and Animation.
III	CSL301	Data Structures Lab	CSL3011	Implement linear data structures & be able to handle operations like insertion, deletion, searching and traversing on them.
			CSL3012	Implement Non-linear data structures & be able to handle operations like insertion, deletion, searching and traversing on them.
			CSL3013	Select appropriate data structure and apply it in various problems
			CSL3014	Select appropriate searching techniques for given problems.
			CSL3015	Demonstrate capabilities of self learning which leads to lifelong learning
III	CSL302	Digital Logic & Computer Organization and Architecture Lab	CSL3021	Understand the basics of digital components
			CSL3022	Understand various types of codes and their conversion.
			CSL3023	Understand the principles of combinational logic design.
			CSL3024	Implement various algorithms for arithmetic operations.
			CSL3025	Design the basic building blocks of a computer: ALU, registers, CPU and memory

			CSL3026	Understand the logic of flip flops and its conversion.
III	CSL303	Computer Graphics Lab	CSL3031	Implement various output primitive algorithms.
			CSL3032	Use and apply various filled area primitive algorithms.
			CSL3033	Apply various transformation algorithms on 2D graphical objects
			CSL3034	Apply clipping algorithms on 2D graphical objects.
			CSL3035	Perform curve and fractal generation methods
			CSL3036	Develop a Graphical application/Animation based on learned concept
III	CSL304	Skill based Lab Course: Object Oriented Programming with Java	CSL3041	Apply fundamental programming constructs of java to solve simple problems.
			CSL3042	Identify classes, objects, members of a class and relationship among them needed for a specific problem and write java application using OOP principles and packages
			CSL3043	Demonstrate the concept of array, strings and vector.
			CSL3044	Implement the concept of inheritance and interfaces.
			CSL3045	Implement the notion of exception handling and multithreading.
			CSL3046	Develop GUI based application.

<b>Computer Engineering</b>				
<b>Sem</b>	<b>Course Code</b>	<b>Course Name</b>	<b>CO Number</b>	<b>Course Outcome Statements</b>
IV	CSC401	Engineering MathematicsIV	CSC4011	Apply the concepts of eigenvalues and eigenvectors in engineering problems.
			CSC4012	Use the concepts of Complex Integration for evaluating integrals, computing residues & evaluate various contour integrals.
			CSC4013	Apply the concept of Z- transformation and inverse in engineering problems.
			CSC4014	Use the concept of probability distribution and sampling theory to engineering problems.
			CSC4015	Apply the concept of Linear Programming Problems to optimization.
			CSC4016	Solve Non-Linear Programming Problems for optimization of engineering problems.
IV	CSC402	Analysis of Algorithm	CSC4021	Analyse the running time and space complexity of algorithms.
			CSC4022	Analyse the complexity of divide and conquer strategy.
			CSC4023	Analyse the complexity of greedy strategy.
			CSC4024	Analyse the complexity of dynamic programming strategy.
			CSC4025	Apply backtracking, branch and bound and string matching techniques to deal with some hard problems.
			CSC4026	Describe the classes P, NP, and NP-Complete and prove that a certain problem is NP-Complete.
IV	CSC403	Database Management System	CSC4031	Describe the fundamentals of a database systems
			CSC4032	Describe the concept of transaction, concurrency and recovery.
			CSC4033	Explain different database Models and Apply different rules for conversion of conceptual model to relational model
			CSC4034	Solve database queries using relational algebra and SQL.
			CSC4035	Construct ER and EER diagram for the real life problems.
			CSC4036	Explain and apply different constraints on Database Design.
			CSC4041	Explain the objectives, functions and structure of OS
			CSC4042	Analyze the concept of process management and evaluate performance of process scheduling algorithms.
			CSC4043	Apply the concepts of synchronization and deadlocks
			CSC4044	Evaluate performance of Memory allocation and replacement policies

IV	CSC404	Operating System	CSC4045	Explain the concepts of file management.
			CSC4046	Apply concepts of I/O management and analyze techniques of disk scheduling.
IV	CSC405	Microprocessor	CSC4051	Describe Architecture and Working of x86 processor.
			CSC4052	Design the program in Assembly and Higher Level Languages for intel x86.
			CSC4053	Elaborate Execution of Interrupts.
			CSC4054	Apply concept for interfacing 8086 processor with peripherals.
			CSC4055	Analyze the architecture of intel 80386 processor
			CSC4056	Apply basics of microprocessor to infer pentium
IV	CSL401	Analysis of Algorithm Lab	CSL4011	Analyze the complexities of various problems in different domains.
			CSL4012	Prove the correctness and analyse the running time of the basic algorithms for those classic problems in various domains.
			CSL4013	Develop efficient algorithms for the new problem with suitable designing techniques.
			CSL4014	Implement the algorithms using different strategies.
IV	CSL402	Database Management System Lab	CSL4021	Construct ER and EER diagram for the real life problem with software tool.
			CSL4022	Apply different rules for Creating and updating database and tables with different DDL and DML statements.
			CSL4023	Apply integrity constraints and provide security to data.
			CSL4024	Construct simple and Complex SQL queries.
			CSL4025	Apply triggers and procedures for specific module/task
			CSL4026	Illustrate Handling of concurrent transactions and access data through front end (using JDBC ODBC connectivity.)
			CSL4031	Implement basic Operating system Commands, Shell scripts, System Calls and API wrt Linux
			CSL4032	Implement various process scheduling algorithms and evaluate their performance.
			CSL4033	Implement and analyze concepts of synchronization and deadlocks.
			CSL4034	Implement various Memory Management techniques and evaluate their performance.

IV	CSL403	Operating System Lab	CSL4035	Demonstrate and analyze concepts of file management and I/O management techniques.
			CSL4036	Demonstrate capabilities of self-learning which leads to lifelong learning
IV	CSL404	Microprocessor Lab	CSL4041	Implement interactive program using interrupts
			CSL4042	Use machine control group of instructions in an assembly language program
			CSL4043	Use string and arithmetic instructions for assembly language programming
			CSL4044	Write mixed language program for arithmetic operations
			CSL4045	Apply architectural knowledge to interface different peripherals with 8086
			CSL4046	Use basic concepts of 8086 in learning advance peripherals
IV	CSL405	Skill Base Lab Course: Python Programming	CSL4051	Demonstrate basic concepts in Python.
			CSL4052	Illustrate file handling and Database handling in Python.
			CSL4053	Build user defined packages and modules in Python.
			CSL4054	Demonstrate two way communication between client and server using Socket Programming in Python.
			CSL4055	Demonstrate concept of Multithreading, Numpy and Pandas
			CSL4056	Develop python based web applications.

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V	CSC501	Theoretical Computer Science	Understand 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.
			Develop an understanding of computation through Turing Machine.
			Acquire fundamental understanding of decidability and undecidability.
V	CSC502	Software Engineering	Identify requirements & assess the process models.
			Plan, schedule and track the progress of the projects.
			Design the software projects.
			Do testing of software project.
			Construct ER and EER diagram for the reallife problems.
			Identify risks, manage the change to assure quality in software projects.
V	CSC503	Computer Network	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.
V	CSC504	Data Warehousing and Mining	Understand data warehouse fundamentals and design data warehouse with dimensional modelling and apply OLAP operations



			Understand 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.
			Describe complex information and social networks with respect to web mining.
V	CSDLO5012	Internet Programming	Implement interactive web page(s) using HTML and CSS.
			Design a responsive web site using JavaScript and demonstrate database connectivity using JDBC.
			Demonstrate Rich Internet Application using Ajax and demonstrate and differentiate various Web Extensions.
			Demonstrate web application using Reactive Js.
V	CSL501	Software Engineering Lab	Identify requirements and apply software process model to selected case study.
			Develop architectural models for the selected case study.
			Use computer-aided software engineering (CASE) tools.
V	CSL502	Computer Network Lab	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.
V	CSL503	Data Warehousing And Mining Lab	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.
V	CSL504	Professional Communication & Ethics II	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.
V	CSM501	Mini Project 2A	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

			<p>Communicate through technical report writing and oral presentation.</p> <ul style="list-style-type: none"><li>● The work may result in research/white paper/ article/blog writing and publication.</li><li>● The work may result in business plan for entrepreneurship product created.</li><li>● The work may result in patent filing.</li></ul>
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VI	CSC601	System Programming and Compiler Construction	Identify the relevance of different system programs.
			Explain various data structures used for assembler and microprocessor design.
			Distinguish between different loaders and linkers and their contribution in developing efficient user applications.
			Understand fundamentals of compiler design and identify the relationships among different phases of the compiler.
VI	CSC602	Cryptograpy & System Security	Understand system security goals and concepts, classical encryption techniques and acquire fundamental knowledge on the concepts of modular arithmetic and number theory.
			Understand, compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication.
			Apply different message digest and digital signature algorithms to verify integrity and achieve authentication and design secure applications.
			Understand network security basics, analyse different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPsec, and PGP.
			Analyse and apply system security concept to recognize malicious code.
			Identify risks, manage the change to assure quality in software projects.
VI	CSC603	Mobile Computing	To identify basic concepts and principles in computing, cellular architecture.
			To describe the components and functioning of mobile networking.
			To classify variety of security techniques in mobile network.
			To apply the concepts of WLAN for local as well as remote applications.
			Explore protocols at application layer.
VI	CSC604	Artificial Intelligence	Ability to develop a basic understanding of AI building blocks presented in intelligent agents.

			Ability to analyze the strength and weaknesses of AI approaches to knowledge– intensive problem solving.
			Ability to design models for reasoning with uncertainty as well as the use of unreliable information.
			Ability to design and develop AI applications in real world scenarios.
VI	CSDLO6011	Internet of Things	Understand 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.
VI	CSL601	System Programming and Compiler Construction Lab	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.
VI	CSL602	Cryptography & System Security Lab	apply the knowledge of symmetric and asymmetric cryptography to implement simple ciphers.
			explore the different network reconnaissance tools to gather information about networks.

			<p>explore and use tools like sniffers, port scanners and other related tools for analysing packets in a Network.</p> <p>set up firewalls and intrusion detection systems using open-source technologies and to explore email security.</p> <p>Explore various attacks like buffer-overflow and web application attack.</p>
VI	CSL603	Mobile Computing Lab	<p>develop and demonstrate mobile applications using various tools.</p> <p>articulate the knowledge of GSM, CDMA &amp; Bluetooth technologies and demonstrate it.</p> <p>Students will able to carry out simulation of frequency reuse, hidden/exposed terminal problem.</p> <p>implement security algorithms for mobile communication network.</p> <p>demonstrate simulation and compare the performance of Wireless LAN.</p>
VI	CSL604	Artificial Intelligence Lab	<p>Identify languages and technologies for Artificial Intelligence.</p> <p>Understand and implement uninformed and informed searching techniques for real world problems.</p> <p>Create a knowledge base using any AI language.</p> <p>Design and implement expert systems for real world problems.</p>
VI	CSL605	Cloud Computing	<p>Identify societal/research/innovation/entrepreneurship problems through appropriate literature surveys.</p> <p>Identify Methodology for solving above problem and apply engineering knowledge and skills to solve it.</p> <p>Validate, Verify the results using test cases/benchmark data/theoretical/inferences/experiments/simulations.</p> <p>Analyze and evaluate the impact of solution/product/research/innovation /entrepreneurship towards societal/environmental/sustainable development.</p> <p>Use standard norms of engineering practices and project management principles during project work.</p>

VI	CSM601	Mini Project 2B	<p>Identify societal/research/innovation/entrepreneurship problems through appropriate literature surveys.</p> <p>Identify Methodology for solving above problem and apply engineering knowledge and skills to solve it</p> <p>Validate, Verify the results using test cases/benchmark data/theoretical/inferences/experiments/simulations.</p> <p>Analyze and evaluate the impact of solution/product/research/innovation /entrepreneurship towards societal/environmental/sustainable development.</p> <p>Use standard norms of engineering practices and project management principles during project work.</p> <p>Communicate through technical report writing and oral presentation.</p> <ul style="list-style-type: none"> <li>● The work may result in research/white paper/ article/blog writing and publication.</li> <li>● The work may result in business plan for entrepreneurship product created.</li> <li>●The work may result in patent filing.</li> </ul>
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VII	CSC701	Machine Learning	To acquire fundamental knowledge of developing machine learning models.
			To select, apply and evaluate an appropriate machine learning model for the given.
			To demonstrate ensemble techniques to combine predictions from different models.
			To demonstrate the dimensionality reduction techniques.
VII	CSC702	Big Data Analysis	Understand the building blocks of Big Data Analytics.
			Apply fundamental enabling techniques like Hadoop and MapReduce in solving real world problems.
			Understand 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, etc
			Apply statistical computing techniques and graphics for analyzing big data.
VII	CSDC7013	Natural Language Processing	To describe the field of natural language processing.
			To design language model for word level analysis for text processing.
			To design various POS tagging techniques and parsers.
			To design, implement and test algorithms for semantic and pragmatic analysis.
			To formulate the discourse segmentation and anaphora resolution.
			To apply NLP techniques to design real world NLP applications.
VII	CSDC7022	Block Chain	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.
VII	ILO7016	Cyber Security and Laws	Understand 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.
VII	CSL70011	Machine Learning Lab	To implement an appropriate machine learning model for the given application.
			To implement ensemble techniques to combine predictions from different models.
			To implement the dimensionality reduction techniques.
VII	CSL7012	Big Data Analytics Lab	To interpret business models and scientific computing paradigms, and apply software tools for big data analytics.
			To implement algorithms that uses Map Reduce to apply on structured and unstructured data

			To implement various data streams algorithms.
			To develop and analyze the social network graphs with data visualization techniques.
VII	CSDL7013	Natural Language processing Lab	Apply various text processing techniques..
			Design language model for word level analysis.
			Model linguistic phenomena with formal grammar.
			Design, implement and analyze NLP algorithms.
			To 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 systems.
VII	CSDL7022	Block Chain Lab	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.
VII	CSP701	Major Project 1	To develop the understanding of the problem domain through extensive review of literature.
			To Identify and analyze the problem in detail to define its scope with problem specific data.
			To know various techniques to be implemented for the selected problem and related technical skills through feasibility analysis.
			To design solutions for real-time problems that will positively impact society and environment..
			To develop clarity of presentation based on communication, teamwork and leadership skills.
			To inculcate professional and ethical behavior.

Sem	Course Code	Course Name	Course Outcome Statements
VIII	CSC801	Distributed Computing	Demonstrate the knowledge of basic elements and concepts related to distributed system technologies.
			Illustrate the middleware technologies that support distributed applications such as RPC, RMI and Object-based middleware.
			Analyze the various techniques used for clock synchronization, mutual exclusion and deadlock.
			Demonstrate the concepts of Resource and Process management.
			Demonstrate the concepts of Consistency, Replication Management and fault Tolerance.
			Apply the knowledge of Distributed File systems in building large-scale distributed applications.
VIII	CSDC8013	Applied Data Science	To gain fundamental knowledge of the data science process.
			To apply data exploration and visualization techniques.
			To apply anomaly detection techniques.
			To gain an in-depth understanding of time-series forecasting.
			Apply different methodologies and evaluation strategies.
			To apply data science techniques to real world applications.
VIII	CSDC8023	Social Media Analytics	Understand the concept of Social media.
			Understand the concept of social media Analytics and its significance.
			Learners will be able to analyze the effectiveness of social media.
			Learners will be able to use different Social media analytics tools effectively and efficiently.
			Learners will be able to use different effective Visualization techniques to represent social media analytics.
			Acquire the fundamental perspectives and hands-on skills needed to work with social media data.
VIII	ILO8023	Entrepreneurship Development and Management	Understand the concept of business plan and ownerships

			Interpret key regulations and legal aspects of entrepreneurship in India.
			Understand government policies for entrepreneurs.
VIII	CSL801	Distributed Computing Lab	Develop test and debug using Message-Oriented Communication or 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.
VIII	CSL70011	Machine Learning Lab	To implement an appropriate machine learning model for the given application.
			To implement ensemble techniques to combine predictions from different models.
			To implement the dimensionality reduction techniques.
VIII	CSL8023	Applied Data Science Lab	Apply various stages of the data science lifecycle for the selected case study.
			Demonstrate data preparation, exploration and visualization techniques.

			Implement and evaluate different supervised and unsupervised techniques.
VIII	CSDL8023	Social Media Analytics Lab	Understand characteristics and types of social media networks.
			Use social media analytics tools for business.
			Collect, monitor , store and track social media data.
			Analyze and visualize social media data from multiple platforms.
			Design and develop content and structure based social media analytics models.
			Design and implement social media analytics applications for business.
VIII	CSP801	Major Project 2	Implement solutions for the selected problem by applying technical and professional skills.
			Analyze impact of solutions in societal and environmental context for sustainable development.
			Collaborate best practices along with effective use of modern tools.
			Develop proficiency in oral and written communication with effective leadership and teamwork.
			Nurture professional and ethical behavior.
			Gain expertise that helps in building lifelong learning experience.

Sem	Course Code	Course Name	Course Outcome Statements
I	FEC201	Engineering Mathematics-I	Apply the basic concepts of Complex Numbers and will be able to use it for engineering problems.
			Apply hyperbolic functions and logarithms in the subjects like electrical circuits, Electromagnetic wave theory.
			Apply the basic concepts of partial differentiation of function of several variables and will be able to use in subjects like Electromagnetic Theory, Heat and Mass Transfer etc.
			Apply the concept of Maxima, Minima and Successive differentiation and 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 the KVL and KCL in electrical networks.
			Apply the concept of Numerical Methods for solving the engineering problems with the help of SCILAB software.
I	FEC102	Engineering Physics-I	Illustrate the fundamentals of quantum mechanics and its application.
			Explain peculiar properties of crystal structure and apply them in crystallography using X-ray diffraction techniques.
			Comprehend the concepts of semiconductor physics and applications of semiconductors in electronic devices.
			Employ the concept of interference in thin films in measurements.
			Discuss the properties of Superconductors and Supercapacitors to apply them in novel applications.
			Compare the properties of engineering materials for their current and futuristic frontier applications.
I	FEC103	Engineering Chemistry-I	Explain the concept of microscopic chemistry in terms of atomic and molecular orbital theory and relate it to diatomic molecules.
			Describe the concept of aromaticity and interpret it with relation to specific aromatic systems.
			Illustrate the knowledge of various types of intermolecular forces and relate it to real gases.
			Interpret various phase transformations using thermodynamics.
			Illustrate the knowledge of polymers, fabrication methods, conducting polymers in various industrial fields.
			Analyze the quality of water and suggest suitable methods of treatment.
I	FEC104	Engineering Mechanics	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 analyze the motion by plotting the relation.
			Illustrate different types of motions and establish Kinematic relations for a rigid body.
			Analyze particles in motion using force and acceleration, work-energy and impulse- momentum principles.
I	FEC105	Basic Electrical Engineering	Apply various network theorems to determine the circuit response / behavior.
			Evaluate and analyze 1- $\Phi$ circuits.
			Evaluate and analyze 3- $\Phi$ AC circuits.
			Understand the constructional features and operation of 1- $\Phi$ transformer.
			Illustrate the working principle of 3- $\Phi$ machine.
			Illustrate the working principle of 1- $\Phi$ machines.
I	FEL101	Engineering Physics-I	Perform the experiments based on interference in thin films and analyze the results.
			Verify the theory learned in the module crystallography.
			Perform the experiments on various semiconductor devices and analyze their characteristics.
			Perform simulation study on engineering materials.
I	FEL102	Engineering Chemistry-I	Determine Chloride content and hardness of water sample.

			Determine free acid ph of different solutions
			Determine metal ion concentration.
			Synthesize polymers, biodegradable plastics.
			Determine Viscosity of oil.
I	FEL103	Engineering Mechanics	Verify equations of equilibrium of coplanar force system.
			Verify law of moments.
			Determine the centroid of plane lamina.
			Evaluate co-efficient of friction between the different surfaces in contact.
			Demonstrate the types of collision/impact and determine corresponding coefficient of restitution.
			Differentiate the kinematics and kinetics of a particle.
I	FEL104	Basic Electrical Engineering	Interpret 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 and machines.
I	FEL105	Basic Workshop Practice-I	Develop the necessary skill required to handle/use different fitting tools.
			Develop skill required for hardware maintenance.
			Able to install an operating system and system drives.
			Able to 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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II	FEC201	Engineering Mathematics-II	Apply the concepts 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 problems.
			Apply concepts of Beta and Gamma function to solve improper integrals.
			Apply concepts of Double integral of different coordinate systems to the engineering problems like area and mass.
			Apply concepts of triple integral of different coordinate systems to the engineering problems and problems based on volume of solids.
			Solve differential equations and integrations numerically using SCILAB software to experimental aspect of applied mathematics.
II	FEC202	Engineering Physics-II	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.
			Discuss the properties of Superconductors and Supercapacitors to apply them in novel applications.
			Interpret and explore basic sensing techniques for physical measurements in modern instrumentations.
II	FEC203	Engineering Chemistry-II	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.
			Illustrate 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.
			Identify different types of corrosion and suggest control measures in industries.
			Illustrate the principles of green chemistry and study environmental impact.
			Explain the knowledge of determining the quality of fuel and quantify the oxygen required for combustion of fuel.
II	FEC204	Engineering Graphics	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.
II	FEC205	C Programming	Formulate simple algorithms for arithmetic, logical problems and translate them to programs in C language.
			Implement, test and execute programs comprising of control structures
			Decompose a problem into functions and synthesize a complete program.
			Demonstrate the use of arrays, strings and structures in C language.
			Understand the concept of pointers.
			Interpret and explore basic sensing techniques for physical measurements in modern instrumentations.
II	FEC206	Engineering Chemistry-II	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.
			Illustrate 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.
			Identify different types of corrosion and suggest control measures in industries.
			Illustrate the principles of green chemistry and study environmental impact.
			Explain the knowledge of determining the quality of fuel and quantify the oxygen required for combustion of fuel.
II	FEC204	Engineering Graphics	Apply the basic principles of projections in Projection of Lines and Planes.
II	FEC206	Professional Communication and Ethics- I	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.