Course Outcome (COs) of CSE Department | Year of study:2023-24	
Department of Computer Science & Engineering	
1FY104	**Communication Skills Year of study: 2023-24**
CO11FY104.1	Students will develop communication skills and techniques which will felicitate their ability to work collaboratively with others
CO11FY104.2	Students will be able to use English grammer accurately that will increase their confidence in English writing and speaking
CO11FY104.3	Students will be able to invent, draft, organize, abstract, elaborate and synthesize their own and other's ideas in formatted way,
CO11FY104.4	Students will learn to use their imagination and produce something on their own after reading stories
CO11FY104.5	Students will be able to apply literary devices after reading stories and poems and also appreciate art in all forms
1FY201	**Engineering Mathematics-I Year of study: 2023-24**
CO11FY201.1	Students will be able to evaluate volume and surface area of the solid formed by revolution of different curves. Also calculate definite integral through Beta and Gamma functions.
CO11FY201.2	Students will be able to classify the concept of sequence, monotonic sequence, Cauchy's sequence and infinite series. Also apply various methods to test convergence and divergence of sequence and infinite series.
CO11FY201.3	Learner will be able to identify to express a function in term of a series of sine and cosine.
CO11FY201.4	Students will be able to evaluate maxima and minima of multivariable functions using the concept of partial differentiation. Also evaluate limit, continuity and differentiability of two variable function
CO11FY201.5	Students will be able to evaluate double and triple integration and to apply the knowledge to determine area, volume, centre of mass and centre of gravity. Further apply the concept of differentiation and integration on vectors
1FY203	**Engineering Chemistry Year of study: 2023-24**
CO11FY203.1	Student would be able to differentiate between hard and soft water. To describe the principles of water characterization and treatment for portable. To use various internal and external treatment softening methods for industry.
CO11FY203.2	Student would be able to classify the fuels (solid, liquid and gaseous) like coal, coke, diesel, natural gas etc and describe their sources, manufacturing, refinement and uses. To learn calorific values and carbonization
CO11FY203.3	Student would be able to explain the principle, causes and consequences of corrosion. To use its knowledge to minimize corrosion to improve industrial designs.

CO11FY203.4	Student would be able to gain the basic knowledge of Inorganic Engineering materials like cement, glass, lubricants. To explain the types, properties, manufacturing and uses of cement and glass. To select lubricants for various purposes.
CO11FY203.5	Student would be able to explain the types of organic reactions and gain basic Knowledge of drugs (Paracetamol and Aspirin)
1FY306	**Programming for Problem Solving Year of study: 2023-24**
CO12FY306.1	Students will be able to write algorithms and draw flowcharts for various problems, using components of flowcharts.
CO12FY306.2	Students will be able to describe architecture of computer and solve number system problems
CO12FY306.3	Students will be able to memorize different data types and operators in C and to write, compile and debug programs in C language.
CO12FY306.4	Students will be able to design flow charts and write programs with multiple instructions, involving decision structures and loops in C.
CO12FY306.5	Students will be able to design flow chart and write programs involving functions and to handle file reading writing operations.
1FY309	**Basic Civil Engineering Year of study: 2023-24**
CO11FY309.1	List the scope and role of Civil Engineering in development of society.
CO11FY309.2	Recognize the importance of surveying and Solve the problems on linear and angular measurement.
CO11FY309.3	Explain the basic concept of building components and describe about the foundation.
CO11FY309.4	Describe the importance of traffic and road safety.
CO11FY309.5	Discuss the functional concept of eco-system and water quality parameter.
2FY202	**Engineering Physics Year of study: 2023-24**
CO12FY202.1	Students Would be able to learn and to apply the basic concepts of interference and diffraction on optical Phenomenon. To interpret the intensity variation of light due to interference and diffraction. To use the concept of Resolving Power.
CO12FY202.2	Students would be able to explain the basic concepts of Quantum Mechanics and apply the knowledge to 1D and 3D potential box problem.
CO12FY202.3	Students would be able to describe the concept of coherence and types of it. To explain working principle of laser, lasing action, various types of lasers and optical fibre. To list the uses of Laser and optical fibres in various fields.

CO12FY202.4	Students would be able to differentiate the types of bonds, to explain the classification of solids according to Band theory and Hall effect. The bases for the band theory are focused to learn the types of Semiconductors and the role of carrier concentrations in conductivity.
CO12FY202.5	Students would be able to formulate and solve the engineering problems on electromagnetism To construct Maxwell's equations from basic principles and use it to solve electromagnetic plane wave equations.
2FY307	**Basic Mechanical Engineering Year of study: 2023-24**
CO11FY307.1	Student will be able to analyze introduction of mechanical engineering and develop knowledge about steam boilers, steam turbines and power plants.
CO11FY307.2	Student will be able to conclude basics of centrifugal, reciprocating pumps and internal combustion engine. Student will be able to create knowledge of various types of refrigeration and air conditioning system with their application.
CO11FY307.3	Student will be able to analyze basic of different types of power transmission systems such as belt, rope, gears and gear trains.
CO11FY307.4	Student will be able to illustrate working of different manufacturing processes.
CO11FY307.5	Student will be able identify different engineering material, their properties and various types of heat treatment processes.
2FY308	**Basic Electrical Engineering Year of study: 2023-24**
CO12FY308.1	Design and analyse complex DC circuits incorporating electrical circuit elements (R, L, and C), voltage and current sources, and Kirchhoff's current and voltage laws using Series-Parallel circuits, Node voltage method, and Mesh current method. Apply the principles of Superposition, Thevenin's, Norton's, and Maximum Power Transfer theorems to optimize circuit performance.
CO12FY308.2	Analyse single-phase AC circuits with R, L, C, RL, RC, and RLC combinations (series and parallel) using sinusoidal waveforms, phasor representation, and peak/r.m.s values. Evaluate power characteristics, including real power, reactive power, apparent power, and power factor. Understand resonance phenomena and voltage/current relationships in three-phase balanced circuits with star and delta connections.
CO12FY308.3	Comprehend the principles of ideal and practical transformers, including the EMF equation and equivalent circuit. Evaluate losses in transformers and their impact on regulation and efficiency.
CO12FY308.4	Analyse the generation of rotating magnetic fields and the construction/working of a three-phase induction motor, separately excited DC motor, and synchronous generators. Evaluate the significance of torque-slip characteristic, starting methods, speed control techniques for induction motors, and torque-speed characteristics.

CO12FY308.5	Power Converters & Electrical Installations: Evaluate the characteristics of semiconductor devices such as PN junction diode, BJT, SCR, power transistor, and IGBT. Analyse the basic circuits of single-phase rectifier with R load, single-phase inverter, and DC-DC converter. Understand the layout of LT switchgear and the types of earthing (SFU, MCB, ELCB, MCCB). Apply power measurement techniques and perform elementary calculations for energy consumption in electrical installations.
2FY201	**Engineering Mathematics-II Year of study: 2023-24**
CO12FY201.1	Students will be able to calculate rank of matrix, characteristic equation & characteristic roots & use the applicability of Cayley Hamilton Theorem to find inverse of matrix which is very important in many engineering application.
CO12FY201.2	Students will able to implement various methods to solve ordinary differential equation of first and Higher order which place important role in all branches of Engineering.
CO12FY201.3	Students will be able to apply various methods to solve ordinary differential equation of second order with variable coefficient which is useful for solving the practical problems which arise in the industry.
CO12FY201.4	Students will be able to solve linear and non linear PDE with Lagrange's form, standard forms and Charpit's method
CO12FY201.5	Students will be able to classify of second order PDE & solve by separation of variables methods on one dimensional heat and wave equations and two dimensinal laplace equations.
2FY105	**Human Values Year of study:2023-24**
CO12FY105.1	Students will identify the importance of happiness through the knowledge of values and skills
CO12FY105.2	Students will develop accuracy regarding the role of basic human aspirations in self and people around them
CO12FY105.3	Students will be able to create harmony in family ,in society along with trust and respect as foundational value of relationship
CO12FY105.4	Students will identify the interconnectedness among the four orders of nature, recyclability, co-existance and harmony at all level of existence.
CO12FY105.5	Students will be prepared for humanistic education , professional competence and ethics and humanistic universal order
3CS201	**Advanced Engineering Mathematics Year of study: 2023-24**
CO23201.1	Students are able to understand the concepts and principles of Random variable and Probability distribution, and able to apply in day to day life
CO23201.2	Students are able to understand the concepts and able to apply different probability distribution to identify and solve real life problem

CO23201.3	Students are able to understand the concepts of the formulation of different mathematical problems into optimization Problems
CO23201.4	Students are able to understand the concepts and apply the principles of optimization using differential calculus
CO23201.5	Students are able to understand the concepts of Linear Programming.
3CS102	**Technical Communication Year of study: 2023-24**
CO23102.1	Students will be able to interpret and know how to follow the stages of the writing process (prewriting/writing/rewriting) and apply them to technical and workplace writing task
CO23102.2	Students will develop skills related to the basic components of definitions, descriptions, process explanations, and other common forms of technical writing.
CO23102.3	Students will be able to read, understand, and interpret material on technology. They will have an appreciation for some of the ideas, issues, and problems involved in writing about technology and in workplace writing.
CO23102.4	Students will be able to get an in depth knowledge of technical communication used in professional life by getting to know all the forms and aspects of Technical Communication.
CO23102.5	Students will be able to express themselves better in technical writing by understanding the concept, style and methodology used in Technical communication.
3CS304	**Digital Electronics Year of study: 2023-24**
CO23304.1	Student will be able to show various number systems and will be able to relate their application in digital electronics.
CO23304.2	Student will be able to apply K-map & QM technique to solve the Boolean function to the simplest form for the implementation of compact digital circuits.
CO23304.3	Student will be able to classify logic families and analyze basic circuits of these families.
CO23304.4	Student will be able to design combinational circuits like half adder full adder, MUX, DEMUX encoder, decoder.
CO23304.5	Student will be able to design various synchronous and asynchronous sequential circuits like registers FLIP FLOP, and counters.
3CS405	**Data Structure and Algorithm Year of study: 2023-24**
CO23405.1	Student will be able to design algorithms and convert those algorithms into a C language code to perform push and pop operation on stack data structure. Students also develop an ability to perform recursion and apply them to the tower of Hanoi problem.
CO23405.2	Student will be able to design algorithms and convert those algorithms into a C language code to perform enqueu, dequeue and traversing operation on queue and Linked list data structure. Student will also able to list the advantages and disadvantages of Linked List.

CO23405.3	Students will be able to write C code to implement Linear search, Binary Search, bubble sort, Insertion sort, selection sort, quick sort, heap sort, merge sort, radix sort and counting sort.
CO23405.4	Students will be able to write C programming code to create binary tree and implement pre, post and in order traversing on the tree data structure.
CO23405.5	Students will be able to write C programming code to implement Hashing. They should be able to perform breadth and depth first search operations on Graph data structure.
3CS406	**Object Oriented Programming Year of study: 2023-24**
CO23406.1	Student should be able to list out different programming paradigm such as top down and bottom up.
CO23406.2	Students should be able to apply various OOPs concept, they should be able to create classes and to call the properties of classes using objects. They should be able to apply access specifiers on the members of the class.
CO23406.3	Students should be able to apply inheritance properties of one class into another. They should be able to apply the concept of virtual functions with aspect to multiple inheritance.
CO23406.4	Students should be able to implement operator overloading function and can perform overriding of functions.
CO23406.5	Student should be able to structure dynamic arrays using template programming. Also, he will be able to define generic functions who can perform operations on different datatypes.
3CS407	**Software Engineering Year of study: 2023-24**
CO23407.1	Student will be summarize fundamental concepts in software engineering, SDLC, software requirements specification, formal requirements specification and verification
CO23407.2	Student will be able to evaluate cost based online of code using Software Project Management .
CO23407.3	Student will be able to structure various documents such as requirement analysis (SRS) and Structured analysis.
CO23407.4	Student will be able to compare various software models based on software design .
CO23407.5	Student will be able to design UML diagrams for a real life problem.
4CS201	**Discrete Mathematical Structure Year of study: 2023-24**
CO24201.1	Students will be able to apply fundamental concepts of set theory, relations, functions and pigeon hole principle in solving various mathematical problems.
CO24201.2	Students will be able to examine the relationship between varieties of arguments using logical notations and classify them as valid/invalid.
CO24201.3	Students will be able to demonstrate the ability to find permutation, combination and lattice.
CO24201.4	Students will be able to learn fundamental concepts of groups and rings.
CO24201.5	Students will be able to calculate distances among the nodes of graph using different traversal methods.

4CS103	Managerial Economics and Financial Accounting Year of study: 2023-24
CO24103.1	Students will be able to analyze economic problems and understand the principles of demand and supply in engineering-related scenarios.
CO24103.2	Students will apply demand forecasting techniques and analyze the elasticity of demand and supply in engineering markets.
CO24103.3	Students will demonstrate proficiency in production and cost analysis, optimizing production processes, and making cost-related decisions for engineering projects.
CO24103.4	Students will evaluate and compare different market structures and understand the pricing theory for various types of markets in the context of engineering businesses.
CO24103.5	Students will be able to analyze and interpret financial statements, perform financial ratio analysis, and apply capital budgeting techniques for engineering projects and investment decisions.
4CS304	Microprocessor & Interfaces Year of study: 2023-24
CO24304.1	Student will be able to illustrate the 8085 microprocessor's architecture, pin description and its functionality in depth. Student will be able to explain about microprocessor-based system by designing logical circuitry in order to interface processor with memory and I/O devices.
CO24304.2	Students will experiment with instructions of 8085 microprocessor, their classification and different programming techniques. Student will be able to identify the addressing modes and length in bytes of instructions.
CO24304.3	Student will be able to write, and analyze assembly language programs of 8085 microprocessor also will be able to categorize various interrupts available in 8085 microprocessor.
CO24304.4	Students are able to demonstrate and explain the working & interfacing of 8085 microprocessor peripheral ICs.
CO24304.5	Student will be able to evaluate communication protocols.
4CS405	Data Base Management System Year of study: 2023-24
CO24405.1	Students will demonstrate their ability to prepare entity-relationship diagrams for Large Enterprises using appropriate database design principles.
CO24405.2	Students will write queries using relational algebra and calculus. Students will be able to write SQL queries and execute them.
CO24405.3	Students will apply normalization techniques to decompose relation into different normal forms.
CO24405.4	Students will differentiate between conflict serializability and view serializability, and to test schedules for serializability.
CO24405.5	Students will be able to identify the deadlock situations. Will also able to list various failure and recovery methods.
4CS406	Theory of Computation Year of study: 2023-24

CO24406.1	Student able to design the base of fundamental concept of Automata theory, formal language, and computation models.
CO24406.2	Student will be able to Analyze and identify differentiate between types of automata, such as finite automata, pushdown automata, and turning machine solve to complex problems.
CO24406.3	Students are able to build Demonstrated proficiency in constructing finite automata , pushdown automata, and turning machine to solve specific computational problem. Comprehend the concept of formal language and Grammars, include regular languages, context-free languages, and context-sensitive languages.
CO24406.4	Student are able to apply Relate the theory of computation to various real-world applications, such as compiler design and language processing and automata theory concept.
CO24406.5	Students are able to evaluate approach can be extremely valuable, as it allows developers to automate the creation of programs or systems from high-level specifications, reducing human effort, and minimizing the potential for manual errors.
4CS407	**Data Communication & Computer Netwoks Year of study: 2023-24**
CO24407.1	Students will be able to summarize the fundamental concepts of the data communication model and communications architecture. They will be able to explain characteristics of different communication mediums along with the classification of signals as digital and analog signals outlining their properties.
CO24407.2	Students will be able to list the functions and protocols of the Data Link Layer. They will be able to apply error detection and correction techniques for reliable data transmission.
CO24407.3	Students will be able to list of role and responsibilities of the Network Link Layer. They will be able to analyse different routing protocols, and distinguish the classful and classless IP addressing.
CO24407.4	Students will be able to explain the underlying principles of transport layer protocols such as multiplexing, demultiplexing, reliable data transfer, flow and congestion control. They will be able to examine the UDP and TCP transport layer protocols and list the difference between them.
CO24407.5	Student will be able to explain the underlying application level protocols used in various applications such as mail, file transfer, web browser, domain name resolution. They will be able to summarize the importance of network security. Also will be able to demonstrate the working of various layers in real life situation.
5CS301	**Information Theory & Coding Year of study: 2023-24**
CO35301.1	Student will be able to List the information measures used for continuous random variables.
CO35301.2	Student will be able to distinguish Prefix code, Huffman code, Shanon-Fane codes and identify the fundamental limits of communication systems.
CO35301.3	Students will be able to apply the principles and techniques of error detection and correction codes for error detection and correction in digital communication systems.

CO35301.4	Students will be able to calculate the performance of error detection and correction codes, including measures such as minimum distance, error detection and correction capabilities, and error probability bounds.
CO35301.5	Students will compare the performance of different coding schemes, considering error detection and correction codes' effectiveness
5CS402	**Compiler Design Year of study: 2023-24**
CO35402.1	Students will be able to summarize major concepts in areas of language translation and compiler design.
CO35402.2	Students will be able to identify, formulate, and solve computer engineering problems with proper systematic & semantic approach
CO35402.3	Students will be able to Develop possible program constructs for further code generation with Type checking.
CO35402.4	Students will be able to analyze various concepts of symbol tables, Run time environments, memory management strategy.
CO35402.5	Students will get the concepts of Intermediate code generation, Code optimization and Code generations.
5CS403	**Operating System Year of study: 2023-24**
CO35403.1	Students will be able to summarize principles of operating systems, design, and implementations, Understand the various components and functions of an operating system.
CO35403.2	Students will be able to analyse and apply suitable Process Scheduling Algorithm and Memory Partition Techniques, apply appropriate techniques to avoid control problems such as mutual exclusion and deadlocks
CO35403.3	Students will be able to memorize deadlock, Methods for handling deadlocks and memory management strategies
CO35403.4	Students will be able to compare various memory management algorithm and CPU scheduling techniques. Implement and evaluate operating system components in Windows and Unix environments
CO35403.5	Students will be able to measure and memorize various file and disk management strategies.
5CS404	**Computer Graphics & Multimedia Year of study: 2023-24**
CO35404.1	Students can list various applications of computer graphics in different fields. Apply scan conversion algorithms to draw lines, circles, and ellipses on a raster display. Implement scan line polygon filling algorithms for area primitives.
CO35404.2	Students can apply transformations to 2D objects using transformation matrices. Utilize composite transformations to efficiently combine multiple transformations.
CO35404.3	Students can list the different methods of 3D display methods. Can apply 3D scaling, rotation, and translation transformations to manipulate objects in a 3D environment.
CO35404.4	Students will be able to list the basic components of illumination models. Describe the purpose and applications of halftone patterns and dithering techniques in image representation.

CO35404.5	Students identify the techniques of morphing and tweening and their purposes. Can also describe how key frame systems and motion specifications contribute to creating smooth animations.
5CS405	**Analysis of Algorithms Year of study: 2023-24**
CO35405.1	Student will be able to design algorithms and to analyze the performance of algorithms by identify different aspects of time and space complexity of recursive and non recursive codes
CO35405.2	Students will able to apply various algorithms for different computing problems using dynamic programming and branch and bound techniques and try to solve different more real time complex problems
CO35405.3	Students will be able to design and evaluate algorithms using various algorithm design techniques for pattern matching algorithms
CO35405.4	Students will be able to analyze randomized algorithms, Recite algorithms that employ randomization.
CO35405.5	Students will be able to relate the concepts of NP Completeness for analyze and solving the complexity of real life problems.
5CS512	**Human-Computer Interaction Year of study: 2023-24**
CO3512.1	Student will be able to list the capabilities of both humans and computers from the viewpoint of human information processing.
C03512.2	Student will be able to describe typical human–computer interaction (HCI) models and styles, as well as various historic HCI paradigms.
CO3512.2	Students will be able to apply an interactive design process and universal design principles to designing HCI systems.
C03512.3	Students will analyze and identify user models& support, socio-organizational issues, and stakeholder requirements of HCIs.
CO3512.3	Students will be able to discuss tasks and dialogs of relevant HCI systems based on task analysis and dialog design.
6CS301	**Digital Image Processing Year of study: 2023-24**
CO36301.1	Students will be able to recall and List the fundamental concepts related to digital image representation, including pixel, resolution, color models, and image formats.
CO36301.2	Students will be able to classify various intensity transformation functions, such as contrast stretching, gamma correction, and logarithmic transformations.
CO36301.3	Students will be able to apply inverse filtering techniques to reverse the effects of blurring or degradation and recover the original image as closely as possible.

CO36301.4	Students will be able to analyze various image compression techniques, both lossless and lossy, to recognize their principles, advantages, and limitations.
CO36301.5	Students will assess the effectiveness of thresholding algorithms in segmenting images and evaluate their performance under different lighting conditions and image characteristics.
6CS402	**Machine Learning Year of study: 2023-24**
CO36402.1	Students will be able to compare various supervised machine learning techniques like LRM, NBCD tree, KNN, SVM, RFA etc. which is suitable for a given problem.
CO36402.2	Students will be able to compare various unsupervised machine learning techniques like K means clustering, Hierarchical Clustering, Probabilistic clustering, ARM, AA, F-P growth algorithm and Gaussian Mixture model which are suitable for a given problem.
CO36402.3	Students will be able to apply various data pre-processing and dimensionality reduction techniques to prepare data for modeling purpose
CO36402.4	Students will be able to solve the problems using various models like policy iteration and value iteration, Q-learning, SARSA, Model based Reinforcement Learning.
CO36402.5	Students will be able to evaluate ANN system and apply it to solve a range of real-world applications, for example, in brain informatics, speech recognition etc.
6CS403	**Information Security System Year of study: 2023-24**
CO36403.1	Students should be able to list different types of security attacks and malware. They should be able to apply substitution and transposition encryption and decryption techniques.
CO36403.2	Students will be able to explain the working of block ciphers like AES and DES work. They'll also be able to list and describe various encryption and decryption modes.
CO36403.3	Students will be able to write the process of how asymmetric key encryption algorithms such as RSA and Rabin cryptosystem works.
CO36403.4	Students will be able to differentiate between the working of Hash functions and Digital signature.
CO36403.5	Students will be able to explain the functioning and use of SSL protocol and Transport layer security protocol. They should be able to explain the symmetric key distribution using symmetric and asymmetric encryptions.
6CS404	**Computer Architecture and Organization Year of study: 2023-24**
CO36404.1	Recall and identify various computer data types, such as integers, floating-point numbers, and characters, and explain the concept of complement representation. Describe the principles of fixed-point and floating-point number representation, analyze register transfer language, and explain the functioning of basic computer organization and its components.

CO36404.2	Demonstrate the ability to write assembly language programs for basic arithmetic and logic operations, utilize program loops and subroutines, and design programs for I/O operations.
CO36404.3	Analyze different addressing modes and instruction formats, compare and contrast RISC and CISC architectures, and explain the concepts of pipelining and Flynn's taxonomy in parallel processing.
CO36404.4	Evaluate various arithmetic algorithms like Booth's multiplication and division algorithms, assess the benefits and challenges of floating-point arithmetic operations, and analyze input-output interfaces and communication techniques, including DMA and interrupt mechanisms.
CO36404.5	Compare different input-output modes, multiprocessor characteristics, and interconnection structures, and synthesize knowledge to assess cache coherence and shared memory multiprocessors' impact on system performance.
6CS405	**Artificial Intelligence Year of study: 2023-24**
CO36405.1	Student able to apply various Search algorithms which help intelligent agents to find solutions to various real life problems
CO36405.2	Student can develop and implement various game playing strategies to make new versions of basic games.
CO36405.3	Students are able to build various knowledge based database for AI system
CO36405.4	Student are able to apply Machine learning algorithms and techniques to solve real world problems
CO36405.5	Students are able to evaluate the performance of NLP tools and System
6CS406	**Cloud Computing Year of study: 2023-24**
CO36406.1	Students will be able to summarize fundamentals and essentials of Cloud Computing.
CO36406.2	Student will be able to compare various cloud infrastructures to understand the tradeoffs in power, efficiency and cost
CO36406.3	Students will be able to apply different levels of virtualization
CO36406.4	Students will be able to Apply best security Practices and techniques to ensure confidentiality ,Integrity and availability of cloud-based systems
CO36406.5	Evaluate and select appropriate cloud Service Providers based on specific business requirements
6CS5-13	**E-Commerce & ERP Year of study: 2023-24**
6CS5-13.1	Students will be able to Explain the characterstics of E-Commerce and ERP systems.
6CS5-13.2	Analyze the impact of E-Commerce on business models and strategies.
6CS5-13.3	Evaluate the role of ERP systems in streamlining business processes.
6CS5-13.4	Design and implement E-Commerce solutions considering security and usability.
6CS5-13.5	Configure and manage ERP systems for efficient resource planning and management.

7CS401	Internet of Things Year of study: 2023-24
7CS401.1	Describe the definition and usage of the term "Internet of Things" in different contexts recognize the key components that make up an IoT system
7CS401.2	Distinguish between the levels of the IoT stack and be familiar with the key technologies and protocols employed at each layer of the stack
7CS401.3	Relate famous IoT relevant Operating systems and hardware.
7CS401.4	Identify the role of big data, cloud computing and data analytics in a typical IoT system
7CS401.5	Design and Develop IOT based applications such as Lake Monitoring System, Air Quality System and Smart Energy Meter.
7AG6-60.2	Environmental Engineering & Disaster Management Year of study: 2023-24
7AG660.1	To identify the significance of a secure water supply system, describe the needs for domestic water in urban and rural locations, and depict various water supply sources, including intakes and delivery systems.
7AG660.2	To review drinking water quality, familiarise themselves with Indian Standards for drinking water, and comprehend the significance of water treatment for ensuring safe drinking water. Also recognise the importance of sanitation in maintaining public health.
7AG660.3	To examine the quantity, characteristics, and appropriate disposal methods of domestic wastewater in both urban and rural areas. To understand different sewer types, design discharge, and hydraulic design considerations for effective wastewater management.
7AG660.4	To identify the quantity, characteristics, and suitable disposal methods for solid waste in urban and rural areas. Discuss the concept of air pollution, the different types of pollutants, their properties, and their effects on living beings.
7AG660.5	To review various types of disasters and recognise the importance of disaster management. Illustrate the role of disaster management in mitigating the impact of disasters on communities and environments.
8CS41	Big Data Analytics Year of study: 2023-24
8CS41.1	Explain the business decision which can be optimized, and competitive advantage created with Big Data.
8CS41.2	Apply the programming aspects of Map Reducing.
8CS41.3	Analyze Hadoop script to manage the Big Data Analytics.
8CS41.4	Interpret scripts with Hadoop to manage the Big Data Analytics.
8CS41.5	Design the script according to Hadoop architecture along with MapReduce Paradigm.

8TT6-60.2	Disaster Management Year of study: 2023-24
8TT6-602.1	Explain the concepts of disasters and hazards, understand their social and environmental implications, and assess risk and vulnerability in various scenarios.
8TT6-602.2	Identify different types of disasters, including hydro-meteorological disasters and geological disasters, and analyse the causes, impacts, and potential preventive measures for each type of disaster.
8TT6-602.3	Recognise various man-made disasters, such as textile processing industrial hazards, major power breakdowns, traffic accidents, and fire hazards. To understand the factors contributing to these disasters and explore ways to prevent or mitigate their effects.
8TT6-602.4	To understand the management roles in disaster mitigation specifically related to the textile industry and illustrate the strategies and policies implemented by management to reduce disaster risks and ensure business continuity.
8TT6-602.5	To comprehend the responsibilities of production personnel in disaster preparedness, response, and recovery, ensuring the safety of the workforce, and minimising production disruptions during disasters.