DEPT. OF CSE(AI & ML)						
R-22 - COURSE OUTCOMES						
S. No	**CLASS**	**REGULATION**	**Subject**	**Course Code**	**CO's**	**Course Oucomes**
1	I-I SEM	R-22	MATRICES AND CALCULUS	MA101BS	CO-1	Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations.
					CO-2	Find the Eigen values and Eigen vectors. Reduce the quadratic form to canonical form using orthogonal transformations.
					CO-3	Solve the applications on the mean value theorems.Evaluate the improper integrals using Beta and Gamma functions
					CO-4	Find the extreme values of functions of two variables with/ without constraints.
					CO-5	Evaluate the multiple integrals and apply the concept to find areas, volumes.
2	I-I SEM	R-22	Engineering Chemistry	CH102BS	CO-1	The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
					CO-2	Students will acquire the basic knowledge of electro chemical procedures related to corrosion and its control.
					CO-3	They can learn the fundamentals and general properties of polymers and other engineering materials.
					CO-4	They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.
					CO-5	Students are able to analyzing the various compounds based on configurational and conformational analysis of molecules and reaction mechanisms
3	I-I SEM	R-22	Programming for Problem Solving	CS103ES	CO-1	Understands the components of a computer system, C Programming Language with conditional branching and loops.
					CO-2	Understands the concept of Arrays, Strings, Structures and Pointers.
					CO-3	Understands the pre processor and file handling in C.
					CO-4	Understands about the functions and dynamic memory allocation and deal location.
					CO-5	Gain knowledge of searching and sorting techniques through algorithm
4	I-I SEM	R-22	Basic Electrical Engineering	EE104ES	CO-1	Understand and analyze basic Electrical circuits
					CO-2	Study the working principles of Electrical Machines and Transformers
					CO-3	To understand working principle, operation of transformers and its types.
					CO-4	Introduce components of Low Voltage Electrical Installations.
					CO-5	To understand and analyze basic Electric and Magnetic circuits. Representation of AC Quantities

5	I-I SEM	R-22	Computer Aided Engineering Graphics	ME105ES	CO-1	Apply computer aided drafting tools to create 2D and 3D objects
					CO-2	Sketch conics and different types of solids.
					CO-3	Appreciate the need of Sectional views of solids and Development of surfaces of solids
					CO-4	Read and interpret engineering drawing.
					CO-5	Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting.
6	I-I SEM	R-22	Elements of Computer Science & Engineering	CS106ES	CO-1	Know the working principles of functional units of a basic Computer
					CO-2	Understand program development, the use of data structures and algorithms in problem solvSing.
					CO-3	Know the need and types of operating system, database systems.
					CO-4	Understand the significance of networks, internet, WWW and cyber security.
					CO-5	Understand Autonomous systems, the application of artificial intelligence.
7	I-I SEM	R-22	Engineering Chemistry Laboratory	CH107BS	CO-1	Students are able to determination of parameters like hardness and chloride content in water
					CO-2	Students are analyzing the various water samples with different methods and various water treatment methods for industrial usages.
					CO-3	Students are able to estimation of rate constant of a reaction from concentration – time relationships.
					CO-4	Students are able to determination of physical properties like adsorption and viscosity
					CO-5	Students are able to calculation of Rf values of some organic molecules by TLC technique
8	I-I SEM	R-22	Programming for Problem Solving Laboratory	CS108ES	CO-1	Able to formulate the algorithms for simple problems and Able to translate given algorithms to a working and correct program.
					CO-2	Able to represent and manipulate data with arrays, strings and structures.
					CO-3	Able to demonstrate the use of pointers and user defined function.
					CO-4	Able to create, read and write to and append to from simple text and binary files.
					CO-5	Able to search and sort data from different array elements.
9	I-I SEM	R-22	Basic Electrical Engineering Laboratory	EE109ES	CO-1	Verify the basic Electrical circuits through different experiments.
					CO-2	Evaluate the performance calculations of Electrical Machines and Transformers through various testing methods.
					CO-3	Analyze the transient responses of R, L and C circuits for different input conditions.
					CO-4	Understand the measurement, calculations and relation between the basic electrical parameters
					CO-5	Understand the basic characteristics of transformers and connections.To Assess the performance of different machines using different methods.

10	I-II SEM	R-22	Ordinary Differential Equations and Vector Calculus	MA201BS	CO-1	Identify whether the given differential equation of first order is exact or not.
					CO-2	Solve higher differential equation with constant coefficients
					CO-3	Apply the concept to find ordinary differential equations using Laplace transforms techniques
					CO-4	Explain gredients, potential functions, directional derivatives of functions of several variables.
					CO-5	Evaluate the line, surface and volume integrals and converting them from one to another .
11	I-II SEM	R-22	Applied Physics	PH202BS	CO-1	Understand physical world from fundamental point of view by the concepts of Quantum mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.
					CO-2	Identify the role of semiconductor devices in science and engineering Applications.
					CO-3	Explore the fundamental properties of dielectric, magnetic materials and energy for their applications
					CO-4	Appreciate the features and applications of Nanomaterials.
					CO-5	Understand various aspects of Lasers and Optical fiber and their applications in diverse fields.
12	I-II SEM	R-22	Engineering Workshop	ME203ES	CO-1	Study and practice on machine tools and their operations
					CO-2	Practice on manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.
					CO-3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
					CO-4	Apply basic electrical engineering knowledge for house wiring practice.
					CO-5	Ability to design and model different Prototypes in the Carpentry Trade Such as cross Lap Joint and Dovetail Joint.
13	I-II SEM	R-22	English for Skill Enhancement	EN204HS	CO-1	Understand the importance of vocabulary and sentence structures.
					CO-2	Choose appropriate vocabulary and sentence structures for their oral and written communication.
					CO-3	Demonstrate their understanding of the rules of functional grammar.
					CO-4	Develop comprehension skills from the known and unknown passages.
					CO-5	Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts. Acquire basic proficiency in reading and writing modules of English.
14	I-II SEM	R-22	Electronic Devices and Circuits	EC205ES	CO-1	Acquire the knowledge of various electronic devices and their use on real life.
					CO-2	Know the applications of various devices.
					CO-3	Acquire the knowledge about the role of special purpose devices and their applications.
					CO-4	Acquire the knowledge about the role of voltages and capacitors
					CO-5	Acquire the knowledge about Zener Diode - Characteristics,

15	I-II SEM	R-22	Applied Physics Laboratory	PH207BS	CO-1	Know the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment.
					CO-2	Appreciate quantum physics in semiconductor devices and optoelectronics.
					CO-3	Gain the knowledge of applications of dielectric constant.
					CO-4	Understand the variation of magnetic field and behavior of hysteresis curve.
					CO-5	Carried out data analysis.
16	I-II SEM	R-22	Python Programming Laboratory	CS206ES	CO-1	Develop the application specific codes using python.
					CO-2	Understand Strings, Lists, Tuples and Dictionaries in Python
					CO-3	Verify programs using modular approach, file I/O, Python standard library
					CO-4	Implement Digital Systems using Python
					CO-5	Implement program to implement Half Adder, Full Adder
17	I-II SEM	R-22	English Language and Communication Skills Laboratory	EN208HS	CO-1	B Better understanding of nuances of English language through audio- visual experience and group activities
					CO-2	Speak clearly with the right accent and intonation
					CO-3	Speak with clarity and confidence which in turn enhances their employability skills
					CO-4	Neutralization of accent for intelligibility
					CO-5	Understand and apply knowledge of human communication and language process.
18	I-II SEM	R-22	IT Workshop	CS209ES	CO-1	Perform Hardware troubleshooting
					CO-2	Understand Hardware components and inter dependencies
					CO-3	Safeguard computer systems from viruses/worms
					CO-4	Document/ Presentation preparation
					CO-5	Perform calculations using spreadsheets
19	II-I SEM	R-22	Mathematical and Statistical Foundations	CS301PC	CO-1	Understand and construct precise mathematical proofs
					CO-2	Apply logic and set theory to formulate precise statements
					CO-3	Analyze and solve counting problems on finite and discrete structures
					CO-4	Describe and manipulate sequences
					CO-5	Apply graph theory in solving computing problems
20	II-I SEM	R-22	Data Structures	CS302PC	CO-1	Ability to select the data structures that efficiently model the information in a problem.
					CO-2	Ability to assess efficiency trade-offs among different data structure implementations or combinations.
					CO-3	Implement and know the application of algorithms for sorting and pattern matching
					CO-4	Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.
					CO-5	Enhance their algorithmic thinking skills and learn how to design algorithms that leverage the strengths of specific data structures to solve problems efficiently.

21	II-I SEM	R-22	Computer Organization and Architecture	CS303PC	CO-1	Understand the basics of instructions sets and their impact on processor design
					CO-2	Demonstrate an understanding of the design of the functional units of a digital computer system.
					CO-3	Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
					CO-4	Design a pipeline for consistent execution of instructions with minimum hazards
					CO-5	Recognize and manipulate representations of numbers stored in digital computers
22	II-I SEM	R-22	Software Engineering	CS304PC	CO-1	Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD)
					CO-2	Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
					CO-3	Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
					CO-4	Understanding of the software development lifecycle, including requirements analysis, design, implementation, testing, deployment, and maintenance.
					CO-5	Learn how to design and conduct software testing to ensure software quality and reliability.
23	II-I SEM	R-22	Operating Systems	CS305PC	CO-1	Will be able to control access to a computer and the files that may be shared
					CO-2	Demonstrate the knowledge of the components of computer and their respective roles in computing
					CO-3	Ability to recognize and resolve user problems with standard operating environments.
					CO-4	Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
					CO-5	Learn about device drivers, I/O operations, interrupt handling, and how the operating system interacts with hardware devices
24	II-I SEM	R-22	Data Structures Lab	CS306PC	CO-1	Ability to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.
					CO-2	Ability to Implement searching and sorting algorithms
					CO-3	Proficient in implementing algorithms associated with data structures, such as sorting and searching algorithms, graph traversal, and tree traversal algorithms.
					CO-4	Will analyse the time and space complexity of their data structure implementation
					CO-5	Understand how different data structures affect the performance of various operations.

25	II-I SEM	R-22	Operating Systems Lab	CS307PC	CO-1	Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.
					CO-2	Able to implement C programs using Unix system calls
					CO-3	Will work with threads and understand how to create, manage, and synchronize threads in a multi-threaded environment.
					CO-4	Will experiment with different CPU scheduling algorithms, such as round-robin, priority-based, and shortest job first, and analyze their performance.
					CO-5	Perform various file system operations, including file creation, reading, writing, and deletion, while understanding the impact of different file system structures.
26	II-I SEM	R-22	Software Engineering Lab	CS308PC	CO-1	Ability to translate end-user requirements into system and software requirements
					CO-2	Ability to generate a high-level design of the system from the software requirements
					CO-3	Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
					CO-4	Gain experience in following software development processes like Agile, Scrum, or Waterfall, understanding the importance of each phase in the development lifecycle.
					CO-5	Will conduct software testing, including unit testing, integration testing, and system testing, to ensure the quality and reliability of the software.
27	II-I SEM	R-22	Constitution of India	*MC310	CO-1	Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
					CO-2	Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
					CO-3	Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
					CO-4	Discuss the passage of the Hindu Code Bill of 1956.
28	II-I SEM	R-22	Skill Development Course (Node JS/ React JS/ Django	CS309PC	CO-1	Build a custom website with HTML, CSS, and Bootstrap and little JavaScript.
					CO-2	Demonstrate Advanced features of JavaScript and learn about JDBC
					CO-3	Develop Server – side implementation using Java technologies like
					CO-4	Develop the server – side implementation using Node JS.
					CO-5	Design a Single Page Application using React.
29	II-II SEM	R-22	Discrete Mathematics	CS401PC	CO-1	Apply the number theory concepts to cryptography domain
					CO-2	Apply the concepts of probability and distributions to some case studies
					CO-3	Correlate the material of one unit to the material in other units
					CO-4	Resolve the potential misconceptions and hazards in each topic of study.
					CO-5	Describe and manipulate sequences

30	II-II SEM	R-22	Automata Theory and Compiler Design	CS402PC	CO-1	Able to understand the concept of abstract machines and their power to recognize the languages.
					CO-2	Able to employ finite state machines for modelling and solving computing problems
					CO-3	Able to design context free grammars for formal languages.
					CO-4	Able to distinguish between decidability and un decidability.
					CO-5	Able to gain proficiency with mathematical tools and formal methods
31	II-II SEM	R-22	Database Management Systems	CS403PC	CO-1	Gain knowledge of fundamentals of DBMS, database design and normal forms
					CO-2	Master the basics of SQL for retrieval and management of data.
					CO-3	Be acquainted with the basics of transaction processing and concurrency control.
					CO-4	Familiarity with database storage structures and access techniques
					CO-5	Study distributed database systems and the challenges associated with data distribution and replication.
32	II-II SEM	R-22	Introduction to Artificial Intelligence	CS404PC	CO-1	Learn the distinction between optimal reasoning Vs human like reasoning and formulate an efficient problem space for a problem expressed in natural language. Also select a search algorithm for a problem and estimate its time and space complexities.
					CO-2	Apply AI techniques to solve problems of game playing, theorem proving, and machine learning.
					CO-3	Learn different knowledge representation techniques.
					CO-4	Understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
					CO-5	Comprehend the applications of Probabilistic Reasoning and Bayesian Networks.
33	II-II SEM	R-22	Object Oriented Programming through Java	CS405PC	CO-1	Able to solve real world problems using OOP techniques
					CO-2	Able to understand the use of abstract classes.
					CO-3	Able to solve problems using java collection framework and I/o classes.
					CO-4	Able to develop multithreaded applications with synchronization.
					CO-5	Able to develop applets for web applications
34	II-II SEM	R-22	Database Management Systems Lab	CS406PC	CO-1	Design database schema for a given application and apply normalization
					CO-2	Acquire skills in using SQL commands for data definition and data manipulation.
					CO-3	Develop solutions for database applications using procedures, cursors and triggers
					CO-4	Learn how to design and implement databases based on specific requirements, including creating tables, defining relationships, and ensuring data integrity.
					CO-5	Become proficient in using SQL (Structured Query Language) to perform various database operations

35	II-II SEM	R-22	Java Programming Lab	CS407PC	CO-1	Able to write programs for solving real world problems using java collection frame work
					CO-2	Able to write programs using abstract classes
					CO-3	Able to write multithreaded programs
					CO-4	Able to write GUI programs using swing controls in Java
					CO-5	Understand multithreading concepts in Java and learn how to write concurrent programs to leverage modern hardware capabilities.
36	II-II SEM	R-22	Real-time Research Project/Field-Based Research Project	CS408PC	CO-1	Apply his/her knowledge to understand the industrial applications
					CO-2	Observe the process of problem identification its formulation and solution.
					CO-3	Prepare a detailed report on the work carried
					CO-4	Present in front of the evaluation committee and other participants
37	II-II SEM	R-22	Gender Sensitization Lab	*MC410	CO-1	Understand the importance of Environmental education, conservation of natural resources & understand the importance of ecosystems and biodiversity
					CO-2	Understand the pollution problems and Apply the environmental science knowledge on solid waste management, disaster management
					CO-3	Apply the environmental science knowledge to improve the resources
					CO-4	Identify the interactions and intersections of identities (e.g., gender, race, ethnicity, class, sexuality, and so on) and assess the ways in which they contribute to instances of privilege and power dynamics across cultures, space, and time. And their problems
38	II-II SEM	R-22	Skill Development Course (Prolog/ Lisp/ Pyswip)	CS409PC	CO-1	Students should be familiar with basic programming concepts such as variables, data types, control structures (like loops and conditionals), functions, and procedures.
					CO-2	Students should be comfortable with logical operators, Boolean algebra, and algorithmic problem-solving techniques.
					CO-3	students should have a basic understanding of functional programming concepts such as higher-order functions, recursion, immutability, and lambda calculus.
					CO-4	students should have a solid understanding of Python programming.
					CO-5	students to think in unconventional ways compared to imperative or object-oriented languages.