

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (Autonomous)

Gandipet, Hyderabad-75

Department of Artificial Intelligence & Machine Learning


Course Outcomes Statement for BE. CSE(AIML) R-22

S.No	Course		Course Outcomes Statements
	Code	Name	
1	22MTC01	Linear Algebra & Calculus	Determine the extreme values of functions of two variables.
			Apply the vector differential operator to scalar and vector functions
			Solve line, surface & volume integrals by Greens, Gauss and Stoke's theorems.
			Determine the basis and dimension of a vector space, compute linear transformation
			Apply the Matrix Methods to solve the system of linear equations
2	22PYC01	Optics and Semiconductor Physics	Demonstrate the physical properties of light
			Explain characteristic properties of lasers and fiber optics
			Find the applications of quantum mechanics
			Classify the solids depending upon electrical conductivity
			Identify different types of semiconductors
3	22CSC01	Problem Solving And Programming	Understand real world problems and develop computer solutions for those problems.
			Understand the basics of Python
			Apply Python for solving basic programming solutions.
			Create algorithms/flowcharts for solving real-time problems.
			Build and manage dictionaries to manage data.
4	22EGC01	English	Illustrate the nature, process and types of communication and communicate effectively without barriers.
			Construct and compose coherent paragraphs, emails and adhering to appropriate mobile etiquette.
			Apply techniques of precision to write a précis and formal letters by using acceptable grammar and appropriate vocabulary.
			Distinguish formal from informal reports and demonstrate advanced writing skills by drafting formal reports.
			Critique passages by applying effective reading techniques




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5	22PYC03	Optics and Semiconductor Physics Lab	Interpret the errors in the results of an experiment.
			Demonstrate physical properties of light experimentally
			Make use of lasers and optical fibers for engineering applications
			Explain the V-I characteristics of some optoelectronic and semiconductor devices
			Find the applications of thermistor
6	22EGC02	English lab	Define the speech sounds in English and understand the nuances of pronunciation in English
			Apply stress correctly and speak with the proper tone, intonation and rhythm
			Analyze listening comprehension texts to enhance their listening skills.
			Determine the context and speak appropriately in various situations.
			Design and present effective posters while working in teams, and discuss and participate in Group discussions.
7	22CSC02	Problem Solving and Programming Lab	Understand various Python program development Environments
			Demonstrate the concepts of Python
			Implement algorithms/flowcharts using Python to solve real-world problems.
			Build and manage dictionaries to manage data.
			Write Python functions to facilitate code reuse.
8	22MEC01	CAD AND DRAFTING	Use Python to handle files and memory.
			Become conversant with appropriate use of CAD software for drafting.
			Recognize BIS, ISO Standards and conventions in Engineering Drafting.
			Construct the projections of points, lines, planes, solids
			Analyse the internal details of solids through sectional views
9	22MEC38	Digital Fabrication Lab	Create an isometric projections and views
			Understand safety measures to be followed in workshop to avoid accidents.
			Identify various tools used in carpentry, house wiring and plumbing.
			Make a given model by using workshop trades like carpentry, plumbing, House wiring and 3d modeling using solid works software for Additive Manufacturing.
			Perform pre-processing operations on STL files for 3D printing, also understand reverse engineering process.
			Conceptualize and produce simple device/mechanism of their choice.


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11	22MTC04	Differential Equations & Numerical Methods	Calculate the solutions of first order linear differential equations.
			Calculate the solutions of higher order linear differential equations.
			Solve the algebraic, transcendental and system of equations.
			Apply interpolation and numerical differentiation techniques for given data.
			Test the convergence and divergence of Infinite series.
12	22CYC01	Chemistry	Identify the microscopic chemistry in terms of molecular orbitals, intermolecular forces and rate of chemical reactions.
			Discuss the properties and processes using thermodynamic functions, electrochemical cells and their role in batteries and fuel cells.
			Illustrate the major chemical reactions that are used in the synthesis of organic molecules.
			Classify the various methods used in treatment of water for domestic and industrial use.
			Outline the synthesis of various Engineering materials & Drugs.
13	22EEC01	Basic Electrical Engineering	Understand the concepts of Kirchhoff's laws and their application various theorems to get solution of simple dc circuits.
			Predict the steady state response of RLC circuits with AC single phase/three phase supply.
			Infer the basics of single phase transformer
			Describe the construction, working principle of DC machine and 3-phase Induction motor.
			Acquire the knowledge of electrical wires, cables, earthing, Electrical safety precautions to be followed in electrical installations and electric shock and its safety and energy calculations.
14	22CSC03	Object Oriented Programming	Understand the concepts of Object-Oriented features.
			Apply OOPs concepts and different libraries to solve programming problems.
			Understand the advanced concepts of Python.
			Develop programs to access databases and web data.
			Understand APIs and third-party libraries to be used with Python.
14	22CYC02	Chemistry Lab	Identify the basic chemical methods to analyse the substances quantitatively & qualitatively.
			Estimate the amount of chemical substances by volumetric analysis.
			Determine the rate constants of reactions from concentration of reactants/ products as a function of time.
			Calculate the concentration and amount of various substances using instrumental techniques.
			Develop the basic drug molecules and polymeric compounds.

15	22MBC02	Community Engagement	Gain an understanding of Rural life, Culture and Social realities.
			Develop a sense of empathy and bonds of mutuality with Local Communities.
			Appreciate significant contributions of Local communities to Indian Society and Economy.
			Exhibit the knowledge of Rural Institutions and contributing to Community's Socio-Economic improvements.
			Utilise the opportunities provided by Rural Development Programmes.
16	22CSC04	Object-Oriented Programming Lab	Demonstrate the features of Object-Oriented Programming.
			Understand APIs and third-party libraries to be used with Python.
			Use Python libraries to solve real-world problems.
			Write scripts to solve data science/machine learning problems using NumPy and Pandas.
			Develop applications by accessing web data and databases.
17	22MEC37	Robotics & Drones Lab	Demonstrate knowledge of the relationship between mechanical structures of robotics and their operational workspace characteristics
			Understand mechanical components, motors, sensors and electronic circuits of robots and build robots.
			Demonstrate knowledge of robot controllers.
			Use Linux environment for robotic programming.
			Write Python scripts to control robots using Python and Open CV.
18	22EEEC02	Basic Electrical Engineering Lab	Comprehend the circuit analysis techniques using various circuit laws and theorems
			Analyse the parameters of the given coil and measurement of power and energy in AC circuits
			Determine the turns ratio/performance parameters of single-phase transformer
			Infer the characteristics of DC shunt motor different tests.
			Illustrate different parts and their function of electrical components, equipment and machines.


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COMMITTED TO
RESEARCH,
INNOVATION AND
EDUCATION

44
years

Course Outcomes Statements for BE (CSE-AIML)-R20

B.E. Program Outcomes (PO's)

Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization for the solution of complex engineering problems

Problem analysis: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling to complex engineering activities, with an understanding of the limitations.


The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Communication: Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective


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reports and design documentation, make effective presentations, and give and receive clear instructions.

Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, member and leader in a team, to manage projects and in multidisciplinary environments.

Life-long learning: Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

R20:

Department Vision

Department Mission

PROGRAM EDUCATION OBJECTIVES (PEOs): After the completion of the program, our:

1. Graduates will apply their knowledge and skills to succeed in their careers and/or obtain advanced degrees, provide solutions as entrepreneurs
2. Graduates will creatively solve problems, communicate effectively, and successfully function in multidisciplinary teams with superior work ethics and values
3. Graduates will apply principles and practices of Computer Science, mathematics and Science to successfully complete hardware and/or software-related engineering projects to meet customer

Program Specific Outcomes (PSOs):

1. Acquire knowledge and practical competency with emerging technologies and open-source platforms related to the areas of Artificial Intelligence and Machine Learning
2. Apply their professional skills in the field of algorithms, networking, image processing and computer vision, deep learning, and data analytics.
3. Provide Novel solutions to existing societal problems by employing contemporary trends in industry.



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Department Of Computer Science and Engineering

Course Outcomes Statement for (BE CSE-AI&ML) R-20

SNo	Course		Course Outcomes Statements
	Code	Name	
1.	20MT C01	Linear Algebra & Calculus	Apply the Matrix Methods to solve the system of linear equations
			Test the convergence and divergence of the infinite Series.
			Determine the extreme values of functions of two variables.
			Apply the vector differential operator to scalar and vector functions
2.	20EG C01	English	Solve line, surface & volume integrals by Greens, Gauss and Stoke's theorems.
			Illustrate the nature, process and types of communication and communicate effectively without barriers.
			Construct and compose coherent paragraphs, emails and adhering to appropriate mobile etiquette.
			Apply techniques of precision to write a précis and formal letters by using acceptable grammar and appropriate vocabulary.
3.	20PY C01	Optics and Semiconductor Physics	Distinguish formal from informal reports and demonstrate advanced writing skills by drafting formal reports.
			Critique passages by applying effective reading techniques
			Demonstrate the physical properties of light.
			Explain characteristic properties of lasers and fiber optics
4.	20CS C01	Programming for Problem Solving	Find the applications of quantum mechanics
			Classify the solids depending upon electrical conductivity
			Identify different types of semiconductors
			Identify and understand the computing environments for scientific and mathematical problems.
			Formulate solutions to problems with alternate approaches and represent them using algorithms / Flowcharts.
			Choose data types and control structures to solve mathematical and scientific problem.
5.	20MT C02	Linear Algebra & Calculus Lab	Decompose a problem into modules and use functions to implement the modules.
			Apply arrays, pointers, structures, and unions to solve mathematical and scientific problems.
			Develop applications using file I/O.
			Apply the Matrix operations in executing various programmes.
			Test the convergence and divergence of the infinite Series.
6.	20EG C02	English lab	Explore the extreme values of functions of two variables.
			Determine the gradient, divergent and curl of scalar and vector point functions.
			Solve line, surface & volume integrals by Greens, Gauss and Stoke's theorems
			Define the speech sounds in English and understand the nuances of pronunciation in English
			Apply stress correctly and speak with the proper tone,


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			intonation and rhythm. Analyze IELTS and TOEFL listening comprehension texts to enhance their listening skills. Determine the context and speak appropriately in various situations. Design and present effective posters while working in teams, and discuss and participate in Group discussions.
7.	20PY C03	Optics and Semiconductor Physics Lab	Interpret the errors in the results of an experiment. Demonstrate physical properties of light experimentally Make use of lasers and optical fibers for engineering applications Explain the V-I characteristics of some optoelectronic and semiconductor devices Find the applications thermistor
8.	20CS C02	Programming for problem Solving Lab	Identify and setup program development environment. Design and test programs to solve mathematical and scientific problems. Identify and rectify the syntax errors and debug program for semantic errors Implement modular programs using functions. Represent data in arrays, pointers, structures and manipulate them through a program. Create, read, and write to and from simple text files.
9.	20ME C01	CAD AND DRAFTING	Become conversant with appropriate use of CAD software for drafting. Recognize BIS, ISO Standards and conventions in Engineering Drafting. Construct the projections of points, lines, planes, solids Analyse the internal details of solids through sectional views Create an isometric projections and views
10.	20MB C02	Community Engagement	Gain an understanding of Rural life, Culture and Social realities. Develop a sense of empathy and bonds of mutuality with Local Communities. Appreciate significant contributions of Local communities to Indian Society and Economy. Exhibit the knowledge of Rural Institutions and contributing to Community's Socio-Economic improvements. Utilise the opportunities provided by Rural Development Programmes.
11.	20MT C03	Differential Equations & Transform Theory	Calculate the solutions of first order linear differential equations. Calculate the solutions of higher order linear differential equations. Examine the series solutions for higher order differential equations. Evaluate the Improper integrals by Fourier Transform. Solve the difference equations by Z-transforms.
12.	20CYC01	Chemistry	Identify the microscopic chemistry in terms of molecular orbitals, intermolecular forces and rate of chemical reactions.

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			Discuss the properties and processes using thermodynamic functions, electrochemical cells and their role in batteries and fuel cells.
			Illustrate the major chemical reactions that are used in the synthesis of organic molecules.
			Classify the various methods used in treatment of water for domestic and industrial use.
			Outline the synthesis of various Engineering materials & Drugs.
13.	20CS C05	Industry 4.0	Identify the key drivers and enablers of Industry 4.0
			Describe the smartness in smart factories, smart cities, smart products, and smart services
			Determine various systems used in manufacturing plants, and their role in an Industry 4.0 world
			Illustrate the power of Cloud Computing in a networked economy
			Understand the opportunities, challenges, brought about by Industry 4.0 and how organizations and individuals should prepare to reap the benefits
14.	20CS C03	Object Oriented Programming	Demonstrate the concepts of Object-Oriented Programming languages to solve problems.
			Apply the constructs like selection, repetition, functions and packages to modularize the programs.
			Design and build applications with classes/modules.
			Find and rectify coding errors in a program to assess and improve performance.
			Develop packages for solving simple real world problems.
			Analyze and use appropriate library software to create graphical interface, mathematical software.
15.	20MT C04	Differential Equations & Transform Theory Lab	Explore all the possible solutions of first order differential equation.
			Analyse the solutions of higher order linear differential equations.
			Examine the series solutions for higher order differential equations.
			Evaluate the Improper integrals by Fourier Transform.
			Apply the Z-transform to solve the difference equations.
16.	20CYC02	Chemistry Lab	Identify the basic chemical methods to analyse the substances quantitatively & qualitatively.
			Estimate the amount of chemical substances by volumetric analysis.
			Determine the rate constants of reactions from concentration of reactants/ products as a function of time.
			Calculate the concentration and amount of various substances using instrumental techniques.
			Develop the basic drug molecules and polymeric compounds.
17.	20CSC04	Object Oriented Programming Lab	Inspect and identify suitable programming environment to work with Python.
			Choose appropriate control constructs, data structures to build the solutions.
			Develop the solutions with modular approach using functions, packages to enhance the code efficiency.

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			Analyze and debug the programs to verify and validate code. Demonstrate use of STLs and modules to build graphical interfaces, mathematical software. Determine the requirements of real-world problems and use appropriate modules to develop solutions.
18.	20ME C02	Workshop / Manufacturing Practice	Understand safety measures to be followed in workshop to avoid accidents. Identify various tools used in fitting, carpentry, tin smithy, house wiring, welding, casting and machining processes. Make a given model by using workshop trades including fitting, carpentry, tinsmithy and House wiring. Perform various operations in welding, machining and casting processes. Conceptualize and produce simple device/mechanism of their choice.
19.	20ME C03	Engineering Exploration	Understand the role of an engineer as a problem solver. Identify multi-disciplinary approaches in solving an engineering problem. Build simple systems using engineering design process. Analyze engineering solutions from ethical and sustainability perspectives. Use basics of engineering project management skills in doing projects.
20.	20EEEC01	Basic Electrical Engineering	Understand the concepts of Kirchhoff's laws and to apply them in superposition, Thevenin's and Norton's theorems to get the solution of simple dc circuits Obtain the steady state response of RLC circuits with AC input and to acquire the basics, relationship between voltage and current in three phase circuits Understand the principle of operation, the emf and torque equations and classification of AC and DC machines Explain various tests and speed control methods to determine the characteristic of DC and AC machines. Acquire the knowledge of electrical wiring, types of wires, cables used and Electrical safety precautions to be followed in electrical installations. Recognize importance of earthing, methods of earthing and various low-tension switchgear used in electrical installations
21.	20ECC35	Basic Electronics	Interpret the usage of semiconductor devices in making circuits like rectifiers, filters, regulators etc Design and Analyse the characteristics of electronic circuits and systems Make use of various types of small and large signal amplifiers for electronic control systems Model a prototype module using the operational amplifier for real time applications Evaluate the performance of various semiconductor devices
22.	20CSC08	Data Structures	Understand the basic concepts of data structures and sorting techniques. Analyze the performance of algorithms.


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			Distinguish between linear and non-linear data structures.
			Apply linear and non-linear data structures
			Identify the significance of balanced search trees, graphs and hashing
			. Establish a suitable data structure for real world applications.
23.	20CSC09	Discrete Mathematics	Describe rules of inference for Propositional and Predicate logic.
			Demonstrate use of Set Theory, Venn Diagrams, relations, functions in Real-world scenarios
			Model solutions using Generating Functions and Recurrence Relations.
			Determine the properties of graphs and trees to solve problems arising in computer science applications.
			Distinguish between groups, semi groups and monoids in algebraic systems.
			Formulate solutions to a variety of real world problems.
24.	20CSC10	Digital Logic Design	Demonstrate the number system conversions and simplify Boolean functions.
			Recall basic theorems and properties of Boolean algebra to represent logical functions in canonical and standard forms.
			Analyze and simplify Boolean expressions using karnaugh-maps and tabulation method.
			Analyze and Design various combinational circuits and Sequential circuits used in Computer Hardware
			Understand the designs of Combinational and Sequential circuits using Verilog HDL.
			Develop different applications by configuring registers, counters and memories.
25.	20CAC01	Fundamentals of Data Science	Understand the significance of data science tools and techniques
			Apply data cleaning, transformation and discretization techniques
			Analyze various inferential statistics and time-series methods
			Understand and apply data visualization techniques.
			Understand predictive analytics and its applications.
			Apply data science techniques to deal with the real-world problems.
26.	20EEC02	Basic Electrical Engineering Lab	Get an exposure to common electrical components, their ratings and basic electrical measuring equipment.
			Make electrical connections by wires of appropriate ratings and able to measure electric power and energy
			Comprehend the circuit analysis techniques using various circuit laws and theorems.
			Determine the parameters of the given coil and calculate the time response of RL & RC series circuits
			Recognize the basic characteristics of transformer and components of switchgear
			Understand the basic characteristics of dc and ac machine by conducting different types of tests on them
27.	20ECC36	Basic Electronics Lab	Demonstrate the concepts of basic electronic components, devices, and systems
			Analyze the measurements of time period, amplitude and phase of different waveforms.
			Design and analyze the behavior of the diode and transistor circuits
			Develop various types of feedback and power amplifiers
			Examine the functionality of various analog and digital circuits


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28.	20CSC11	Data Structures Lab	Implement the abstract data type.
			Implement linear data structures such as stacks, queues using array and linked list.
			Implement non-linear data structures such as trees, graphs
			Analyze various sorting techniques
			Analyze various algorithms of linear and nonlinear data structures.
			Design and develop real world problem using suitable data structures.
29.	20CAC02	Fundamentals of Data Science Lab	Understand the significance of data science tools.
			Apply statistical methods to implement functionalities in Numpy, Scipy, Pandas packages
			Analyze the significance of Inferential Statistics.
			Apply Exploratory Data Analytical Techniques to visualize Single variable
			Apply Exploratory Data Analytical Techniques to visualize Multiple variables.
30.	20CA101	MOOCs / Training / Internship	Analyze the significance of Time Series Forecasting.
			On successful completion of this course, Student will be able to:
31.	20ACT	Activity Points	
32.	20MTC13	Mathematical Foundation for Data Science & Security	Analyze the coefficient of skewness and fitting of the data by various methods
			Apply properties of Mathematical Expectations and analyse the various distributions.
			Evaluate areas of curves by using various distributions
			Apply various technics of Number Theory for solving problems
			Apply RSA –PKC for solving security issues.
33.	20CSC13	Computer Architecture and Microprocessor	Understand the functional block diagram of single bus architecture of a computer and describe the function of the instruction execution cycle, RTL interpretation of instructions, addressing modes, instruction set.
			Design assembly language program for specified computing 16 bit multiplication, division and I/O device interface.
			Derive flowchart for Concurrent access to memory and cache coherency in Parallel Processors and describe the process.
			Design a memory module and analyze its operation by interfacing with the CPU.
			Apply design techniques to enhance performance using pipelining, parallelism and RISC methodology.
			Develop testing and experimental procedures on Microprocessor and analyze their operation under different cases.
34.	20CSC14	Data Base Management Systems	Classify the difference between FMS and DBMS; describe the roles of different users and the structure of the DBMS Design the database logically using ER modeling.
			Outline the schema of the relational database and key constraints. Develop queries using fundamental ,extended operators of relational algebra and DDL, DML and DCL of SQL
			Explore the inference rules for functional dependencies and apply the principles of normal forms to decompose the relations in a database.
			Summarize the concepts of dense, sparse, ISAM and B+ tree indexing and get familiar with static and extendable techniques of hashing.
			Explain the states and properties of transaction. Interpret the locking, time stamp, graph and validation based protocols for concurrency control.
			Relate log based, ARIES recovery techniques to increase the

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			robustness of the database, identify to resolve the deadlocks in the transaction.
35.	20CSC15	Internet and Web Technologies	Understand the technologies required for developing web application.
			Identify and choose XHTML tags, CSS and java scripts to develop well-structured and easily maintained web pages.
			Design and Develop interactive and innovative web pages using various platforms/technologies like XHTML, CSS, XML, JAVASCRIPT.
			Create and deploy web applications in web server by using server-side programming concepts like Python
			Build a data driven web site using different frameworks and Databases
			Evaluate different web applications to implement optimal solutions for real time problems.
36.	20CAC03	Artificial Intelligence	Explain the role of agents and interaction with the environment to establish goals.
			Identify and formulate search strategies to solve problems by applying suitable search strategy.
			Compare and contrast the various knowledge representation schemes of AI
			Appraise probabilistic reasoning and Markov decision process to solve real world problems.
			Apply the AI concepts to build an expert system to solve the real-world problems
			Describe learning paradigms in machine learning.
37.	20MBC01	Engineering Economics & Accountancy	Apply fundamental knowledge of Managerial Economics concepts and tools
			Analyze various aspects of Demand Analysis, Supply and Demand Forecasting
			Understand Production and Cost relationships to make best use of resources available
			Apply Accountancy Concepts and Conventions and preparation of Final Accounts.
			Evaluate Capital and Capital Budgeting decision based on any technique.
38.	20MTC14	Mathematical Foundation for Data Science & Security Lab	Analyze the coefficient of skewness and fitting of the data by various methods
			Apply properties of Mathematical Expectations and analyze the various distributions
			Evaluate areas of curves by using various distributions.
			Apply various techniques of Number Theory for solving problems
			Apply RSA –PKC for solving security issues.
39.	20CSC17	Data Base Management Systems Lab	Outline the built-in functions of SQL and apply these functions to write simple and complex queries using SQL operators .
			Demonstrate Queries to Retrieve and Change Data using Select, Insert, Delete and Update. Construct Queries using Group By, Order By and Having Clauses.
			Demonstrate Commit, Rollback , Save point commands , SQL Plus Reports and formulate the Queries for Creating, Dropping and Altering Tables, Views, constraints
			Develop queries using Joins, Sub-Queries and Working with Index, Sequence, Synonym, Controlling Access and Locking Rows for Update, Creating Password and Security features
			Demonstrate the usage of data types , Bind and Substitution Variables , Anchored, Declarations , Assignment Operation and PL/SQL code using Control Structures


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			Develop PL/SQL code using Cursors, Exception, Composite Data Types and Procedures, Functions and Packages.
40.	20CSC18	Internet and Web Technologies Lab	<p>. Identify and install web development tools.</p> <p>Develop client side web pages using XHTML, CSS and XML.</p> <p>Create dynamic, interactive web applications using java script</p> <p>Develop server side web application using Django Frame work.</p> <p>Understanding working of Ajax, Node.js and JSON</p> <p>Identify and explore different frame works for web applications</p>
41.	20ACT	Activity Points	-
42.	20CSC12	Design and Analysis of Algorithms	<p>Identify and apply asymptotic notations to measure the performance of algorithms.</p> <p>Describe the algorithmic design techniques of divide and conquer, greedy, dynamic programming, backtracking and branch and bound to solve problems.</p> <p>Apply suitable algorithmic design techniques to solve problems to get optimal solution.</p> <p>Analyze the performance of algorithmic design techniques.</p> <p>Evaluate the efficiency of alternative solutions derived for a problem by applying various algorithmic design techniques</p> <p>Understand P, NP, NP-Hard, NP-Completeness and Reducibility</p>
43.	20CSC20	Operating Systems	<p>Identify the basics of an operating systems and its major components.</p> <p>Understand the concepts related to process synchronization and deadlocks.</p> <p>Distinguish various memory management techniques.</p> <p>Interpret various threats and defense mechanisms used to protect the system.</p> <p>Evaluate various file allocation methods</p> <p>Apply security as well as recovery features in the design of algorithms.</p>
44.	20CSC22	Software Engineering	<p>State the software process and explain perspective process model, evolutionary process models</p> <p>Understand the agile Software process models and demonstrate the skills necessary to specify the requirements of software product so as to prepare SRS document.</p> <p>Recall the modeling concepts and estimate the cost of software using empirical models</p> <p>Enlist the design principles and construct a product using coding principles and standards.</p> <p>Develop test cases and apply software testing methods in conventional and O-O approaches and estimates software quality of SW.</p>
45.	20CAC04	Machine Learning	<p>Define the basic concepts related to Machine Learning.</p> <p>Recognize the underlying mathematical relationships across ML algorithms and their paradigms.</p> <p>Determine the various applications of Machine Learning.</p> <p>Model, design and develop solutions to real world problems using Machine Learning Algorithms.</p> <p>Evaluate and interpret the results of the various machine learning tools</p>
46.	20CSE03	System Modeling and Simulation	<p>Create a computer simulation based on the physical characteristics of the system</p> <p>Solve ordinary and partial differential equations with computational methods</p> <p>Display insight into the uncertainties in a system and how they can be characterized</p> <p>Manipulate the data structures of numerical computing;</p>


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			matrices, and vectors, and visually represent data sets coming from computer simulations
47.	20CSE12	Embedded Systems	<p>Understand the basics of embedded systems.</p> <p>Analyze the core concepts of Embedded System and Embedded System Architecture.</p> <p>Design and develop Embedded System hardware and software using Embedded C.</p> <p>Analyze the operating system for embedded systems</p> <p>Analyze the embedded system development environment and tools used in embedded software development process.</p>
48.	20CSE24	Blockchain Technology	<p>Understand the significance of Blockchain technology and its associated components</p> <p>Understand the need for consensus protocols in Blockchain</p> <p>Experience the Ethereum and Hyperledger Fabric Platforms</p> <p>Incorporate Blockchain in financial software Systems and supply chain environments.</p> <p>Devise the need for Blockchain in Government sectors</p> <p>Understand the significance of Blockchain Security</p>
47.	20CSE26	Human Computer Interaction	<p>Understand the structure of models and theories of human computer interaction.</p> <p>Understand the vision of a computer user.</p> <p>Understand the recognition and remembrance limitations of a computer user.</p> <p>Understand and analyze the mobile ecosystem and tools for mobile design</p> <p>Design an interactive mobile interfaces for mobile applications and widgets</p> <p>Design an interactive web interface for web applications.</p>
48.	20CAE01	Reinforcement Learning	<p>Illustrates various elements of reinforcement techniques.</p> <p>Define the key features of reinforcement learning that distinguishes it from AI and non-interactive machine learning</p> <p>Analyze any given application; decide if it is formulated as reinforcement learning problem</p> <p>Apply Monte Carlo method and Temporal-Difference(TD) learning for prediction</p> <p>Apply Planning and Learning with Tabular Methods.</p> <p>Use Value Prediction with Function Approximation concepts.</p>
49.	20CAE02	Digital Image Processing	<p>Explain the basic principles of image processing and its significance in real world</p> <p>Interpret various types of images and applies image transformations.</p> <p>Evaluate various approaches for image segmentation and image restoration</p> <p>Define image processing methods and recognize morphological image processing techniques</p> <p>Recognize image compression and comprehend image compression techniques in both domains</p> <p>Apply image processing algorithms for real world problems.</p>
50.	20ECO10	Fundamentals of Wireless Communication	<p>Understand the overview of Wireless Communication.</p> <p>Relate the cellular concepts like frequency reuse, hand off, coverage and capacity.</p> <p>Analyse the mobile radio propagation with large scale and small scale fading</p> <p>Select the suitable diversity technique to combat the multipath fading effects.</p> <p>Compare the multiple access techniques and apply to wireless standards</p>
51.	20EEO05	Waste Management	Categorize the waste based on the physical and chemical properties.

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			<p>Explain the Hazardous Waste Management and Treatment process.</p> <p>Illustrate the Environmental Risk Assessment, methods, mitigation and control</p> <p>Interpret the Biological Treatment of Solid and Hazardous Waste</p> <p>Identify the waste disposal options, describe the design and construction, Operation, Monitoring, Closure of Landfills</p>
52.	20MEO09	Organizational Behaviour	<p>Understand Organizational Behavioral principles and practices.</p> <p>Compare various organizational designs and cultures enabling organizational development.</p> <p>Apply motivational theories and leadership styles in resolving employee's problems and decision making processes</p> <p>Understand the group dynamics, communication network, skills needed to resolve organizational conflicts.</p> <p>Analyze the behavior, perception and personality of individuals and groups in organizations in terms of the key factors that influence organizational behavior.</p>
53.	20MTO03	Quantum Computing	<p>Compute basic mathematical operations on Quantum bits</p> <p>Execute Quantum operations of Quantum computing</p> <p>Built quantum programs</p> <p>Develop quantum Logical gates and circuits</p> <p>Develop the quantum algorithm</p>
54.	20BTO04	Bioinformatics	<p>Explain the basic concepts of biology and bioinformatics.</p> <p>Identify various types of biological databases used for the retrieval and analysis of the information</p> <p>Explain the sequence analysis and data mining</p> <p>Discuss the methods used for sequence alignment and construction of the phylogenetic tree.</p> <p>Describe the methods used for gene and protein structure prediction</p>
55	20CSC16	Design and Analysis of Algorithms Lab	<p>Implement greedy, dynamic programming, backtracking and branch and bound techniques.</p> <p>Demonstrate various algorithmic design techniques</p> <p>Analyze the performance of various algorithms</p> <p>Compare various design strategies</p> <p>Formulate solutions to solve real world problems use acquired knowledge</p>
56.	20CSC23	Operating Systems Lab	<p>Understand Linux/Unix environment.</p> <p>Identify and interpret various system programs.</p> <p>Understand and implement shell programming.</p> <p>Simulate memory management and file allocation techniques.</p> <p>Analyze process and file management system calls by creating and/or modifying concurrent programs.</p> <p>Build network-oriented applications using system calls</p>
57.	20CSC25	Case Studies Lab using UML	<p>Identify the problem scope and constraints in the problem.</p> <p>Prepare software requirements specifications (SRS) for the system according to standards.</p> <p>Apply the design notations of structured approach to develop ER and Data Flow Diagrams.</p> <p>Apply/Use the design notations of OO approach to develop UML diagrams using rational tools.</p> <p>Implement, analyze and prepare the documentation for the proposed system.</p>
58.	20CAC05	Machine Learning Lab	<p>Identify the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.</p> <p>Identify and utilize modern tools that are useful for data analysis</p> <p>. Recognize and implement various ways of selecting suitable</p>


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			<p>model parameters for different machine learning techniques</p> <p>Implement and evaluate various Machine Learning approaches</p> <p>Apply Keras and Tensorflow to implement ML techniques</p>
59.	20CAI02	Internship-II (Industrial/Rural Internship)	
60.	20CSC21	Data Communication and Computer Networks	<p>Learn the communication protocol suites like ISO-OSI and TCP/IP</p> <p>Illustrate and explain Data Communications System and its components.</p> <p>Identify and analyze various congestion control algorithms</p> <p>Distinguish the internet protocols like IP, ARP, ICMP, IGMP, routing protocols and DHCP</p> <p>Understand the transport layer protocols like TCP, UDP, RTCP.</p> <p>Identify various application layer protocols like HTTP, WWW, DNS, Email Protocols, FTP and the underlying protocols.</p>
61.	20CAC06	Deep Learning for Computer Vision	<p>Understand various optimization techniques used in deep learning.</p> <p>Analyze various Autoencoders and Regularization Techniques.</p> <p>Design and Develop various Convolution Neural Networks architectures.</p> <p>Design various RNNs and Encoder Decoder Models.</p> <p>Understand the importance of GANs to develop real-time applications</p> <p>Evaluate the Performance of different models for deep neural network training</p>
62.	20CIC07	Theory of Computation & Compilers	<p>Understand formal language basics and the power of automata to recognize the languages.</p> <p>Analyze the concept compilation Process and data structures of a compiler</p> <p>Attains the knowledge of context free grammars and able to implement parsers</p> <p>Design Syntax directed translation scheme for a given Context free grammar and generation of intermediate code.</p> <p>Apply Optimization to intermediate code and machine code</p> <p>Illustrate various object forms, error recovery and tools of a compiler.</p>
63.	20CSC30	Cryptography and Network Security	<p>Analyze and design classical encryption techniques and block ciphers.</p> <p>Analyze and design hash and MAC algorithms, and digital signatures.</p> <p>Design network application security schemes like PGP, S/MIME, IPsec, SSL, TLS, HTTPS, SSH, etc</p> <p>Evaluate the authentication and hash algorithms</p> <p>Create and configure simple firewall architectures.</p> <p>Understand digital sign in emails and files.</p>
64.	20CSE06	Soft Computing	<p>Understand various soft computing concepts and techniques.</p> <p>Analyze and design various learning models.</p> <p>Apply the neural network architecture for various real time applications.</p> <p>Examine and approximate reasoning using fuzzy logic.</p> <p>Design genetic algorithms for various applications.</p> <p>Develop soft computing techniques to solve different applications.</p>
65.	20CSE07	Internet of Things	<p>Understand IoT, its hardware and software components.</p> <p>Comprehend I/O interface and programming APIs</p> <p>Analyze the use of communication protocols in IoT.</p> <p>Explore Solution framework for IoT applications</p> <p>Illustrate unstructured data storage</p>


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			Develop real time IoT based projects.
66.	20CSE11	Natural Language Processing	Understand the basic concepts of Natural language processing pipeline and applications of NLP.
			Illustrate various text representation techniques in NLP.
			Analyse text classification techniques and deep learning basics to process natural language text.
			Explore text summarization methods and example systems.
			Demonstrate levels of NLP for several case studies
			Apply NLP Pipe lines to solve real world applications.
67.	20CAE03	Computer Vision	Recognize the basics of computer vision and its challenging issues.
			Develop algorithms to analyze feature detection and alignment.
			Interpret images and videos for problems such as tracking and structure from motions.
			Identify object, scene recognition and categorization algorithms for real time images.
			Analyze recovery of 3D structure of ill-posed scenes.
			Apply various techniques to build computer vision applications.
68.	20CSE05	Optimization Techniques	Calculate the optimum values for given objective function by LPP
			Solve the solution for maximize the profit with minimum cost by Transportation problem
			Determine the optimum feasible solution for assignment and travelling salesman problems and computing the optimal solution for Job sequencing models
			Compute the optimum values for given objective function by IPP and optimal strategy for games
			Identify critical path using network scheduling.
69.	20CSE25	Social Computing	Identify the significance of social networks, representation, ranking techniques and challenges.
			Understand a broad range of social networks concepts and theories
			Ascertain the network analysis knowledge in a diversified aspect of society.
			Analyze social network links and web search
			Differentiate between centralized and decentralized search models
			Generate and communicate the analysis results and impact of social networks.
70.	20CAE04	Algorithmic Game Theory	Acquire knowledge about the real world problems and formulate mathematical models of these problems.
			Identifying the algorithmic Models for finding the optimal solutions for real world examples
			Analyze the major limitations and capabilities of game theory problems.
			Design and analyze problems using game theory approaches
			Explore the real world scenarios of economic and algorithmic interactions using game theory solutions.
71	20CAE05	Multi Agent Intelligent Systems	Understand various aspects of multi agent systems and architecture of intelligent agents.
			Understand of various types of reasoning Agents
			Acquire knowledge of multi agent systems communication and cooperation methods
			Classify various types of decision-making processes for multi agent systems
			Use appropriate framework for agent communication and information sharing processes
			Explore different kinds of Auctions for multi agent environment


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			and applications.
72	20CAE06	Data and Visual Analytics	Understand the key techniques and theory used in visualization, including data models, graphical perception.
			Analyze techniques for visual encoding and interaction
			Apply knowledge to a number of common data domains and corresponding analysis tasks, including multivariate data, networks, text, and cartography
			Describe big data and use cases from selected business domains
			Explain NoSQL big data management and other technologies such as Hadoop and HDFS
73	20ECO01	Remote Sensing and GIS	Demonstrate the understanding of basic concepts of remote sensing and interpret energy interactions
			Choose an appropriate technique for a given scenario by appreciating the types of remote sensing.
			Distinguish the principle behind the working of microwave and LiDAR sensing.
			Apply Microwave remote sensing techniques
			Explain the procedure for encoding data and geospatial data analysis.
74	20MTO01	Financial Mathematics	Calculate the internal rate of return, annuity and amortization.
			Apply the portfolio theory.
			Examine the binomial model of pricing.
			Analyze the stochastic differential equations
75.	20EEO02	Energy Management Systems	Analyze the stochastic differential equations
			Know the current Energy Scenario and importance of Energy Conservation
			Understand the concepts of Energy Management, Energy Auditing.
			Interpret the Energy Management methodology, Energy security and Energy Strategy
			Identify the importance of Energy Efficiency for Engineers and explore the methods of improving Energy Efficiency in mechanical systems, Electrical Engineering systems
76	20EGO01	Technical Writing Skills	Illustrate the Energy Efficient Technologies in Civil and Chemical engineering systems
			Communicate effectively, without barriers and understand aspects of technical communication.
			Differentiate between general writing and technical writing and write error free sentences using technology specific words
			Apply techniques of writing in business correspondence and in writing articles.
			Draft technical reports and technical proposals.
77.	20CEO02	Disaster Risk Reduction and Management	Prepare agenda and minutes of a meeting and demonstrate effective technical presentation skills
			Identify and understand the concepts of hazards, causes and impacts of disasters.
			Develop a critical capacity to evaluate the principles and practices of disaster risk reduction and management;
			Develop a deep awareness of disaster resilience, risk mitigation, and recovery policies as they arise from natural hazards around the globe;
			Apply knowledge about existing global frameworks and existing agreements and role of community in successful Disaster Risk Reduction
78	20CHO04	Environmental and Sustainable Development	Evaluate DM study including data search, analysis and presentation as a case study.
			To relate sustainability concepts and ethical principles towards environment.
			To understand the different types of environmental pollution

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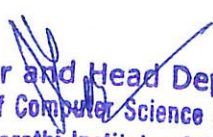
			<p>problems and their respect sustainable solutions.</p> <p>To become aware of concepts, analytical methods/models, and resources for evaluating and comparing sustainability implications of engineering activities</p> <p>To critically evaluate existing and new methods</p> <p>To develop sustainable engineering solutions by applying methods and tools to research a specific system design.</p> <p>To apply concepts of sustainable development to address sustainability challenges in a global context</p>
79.	20EGMO3	UNIVERSAL HUMAN VALUES-II: UNDERSTANDING HARMONY	<p>Students are expected to become more aware of themselves, and their surroundings (family, society, nature)</p> <p>They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.</p> <p>They would have better critical ability.</p> <p>They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).</p> <p>It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction</p>
80.	20CAC07	DEEP LEARNING FOR COMPUTER VISION LAB	<p>Evaluate the performance various optimization techniques used in deep learning.</p> <p>Analyze various Autoencoders and Regularization Techniques.</p> <p>Design and Develop various Convolution Neural Networks architectures.</p> <p>Analyze various RNNs and Encoder Decoder Models</p> <p>Understand the importance of Transformers and GANs to develop real-time applications.</p> <p>Evaluate the Performance of different models for deep neural network training</p>
81.	20CSC31	CRYPTOGRAPHY AND NETWORK SECURITY LAB	<p>Identify basic security attacks and services</p> <p>Design symmetric and asymmetric key algorithms for cryptography</p> <p>Create and use of Authentication functions</p> <p>Identify and investigate network security threat</p> <p>Analyze and design network security protocols</p>
82.	20CSE15	SOFT COMPUTING LAB	<p>Implement McCulloch-Pitts model for Boolean operations</p> <p>Apply perceptron learning algorithm for a given problem.</p> <p>Design and analyze various Neural Networks Architectures.</p> <p>Apply concepts of fuzzy sets on real-time applications</p> <p>Implement Genetic Algorithms with its operators</p> <p>Apply soft computing strategies for various real time applications</p>
83.	20CSE16	INTERNET OF THINGS LAB	<p>Use of various hardware and software IoT components</p> <p>Perform experiments by Interfacing I/O devices, sensors to Raspberry Pi/Arduino.</p> <p>Understand and analyze communication protocols in IoT</p> <p>Monitor data and controlling of devices.</p> <p>Develop Real time IoT based projects.</p>
84.	20CSE20	NATURAL LANGUAGE PROCESSING LAB	<p>Understand the basic concepts of Natural language processing pipeline</p> <p>Implement various feature engineering and text representation techniques in NLP</p> <p>Illustrate text classification techniques to build NLP models</p> <p>Explore text summarization methods and example systems</p> <p>Demonstrate levels of NLP deep learning basics to process natural language text.</p>


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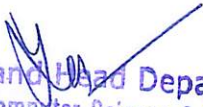
			Implement NLP Pipe lines used to solve real world applications
85.	20CAE07	COMPUTER VISION LAB	Recognise the fundamental issues and challenges of computer vision.
			Interpret edges using various kernels and transformations
			Analyze images and videos for problems such as tracking and structure from motion
			Identify object, scene recognition and categorization algorithms for real time images
			Evaluate computer vision system for real world problems
86.	20CAC08	Cloud Technologies	Define the main concepts, technologies, strengths, and limitations of cloud computing.
			Identify the key and enabling technologies that help in the development of the cloud.
			Develop the ability to understand and use the architecture of compute, cloud storage, service and delivery models
			Explain the core issues of cloud computing such as resource management and security.
			Evaluate and choose the appropriate technologies, and approaches for implementation, and use of the cloud.
87.	20CSE10	Devops	Identify components of Devops environment.
			Describe Software development models and architectures of DevOps.
			Apply different project management, integration, testing and code deployment tools.
			Investigate different DevOps Software development models.
			Assess various Devops practices.
88.	20CSE37	High Performance Computing	Collaborate and adopt Devops in real-time projects
			Understand different parallel computing architectures and networks
			Ability to design parallel algorithms and measure their performance.
			Understand vector processing, memory bottlenecks, data and thread-level parallelism.
			Understand the various programming frameworks like MPI, OpenMP and CUDA.
89.	20CSE36	Cyber Security	Understand cache coherence protocols and read-write semantics of parallel programs
			Gain knowledge of writing efficient parallel programs.
			List the different types of cybercrimes and analyze legal frameworks to handle cybercrimes.
			Discuss the cyber offence and vulnerabilities in programming languages.
			Identify the Tools and Methods used in cybercrimes.
90.	20CSE08	Enterprise Application Development	Analyze and resolve cyber security issues and laws governing Cyberspace.
			Describe the need of Digital Forensics and the importance of digital evidence in prosecution.
			Interpret the commercial activities in the event of significant information security incidents in the Organization.
			Understand the database connectivity and application servers.
			Explore the type of forms with validations using ReactJS.
91.	20CAE08	Big Data Frameworks	Utilize Express framework to develop responsive web applications.
			Demonstrate the architecture and file system of NodeJs.
			Identify the significance of component intercommunication with Angular2
			Adapt MEAN or MERN stack to implement a real-time web application.
			Understand the significance of bigdata and frameworks


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			associated with it
			Deploy hadoop framework and map reduce programming
			Understand the significance of Apache Spark
			Analyze various NoSQL databases, their characteristics and challenges.
			Implement real world applications using NoSQL databases such as MongoDB.
92.	20PYO01	HISTORY OF SCIENCE AND TECHNOLOGY	Demonstrate the process of beginning of science and civilization, knowledge acquisition and philosophical approach of science and its advancements in the Stone Ages and Antiquity period
			Illustrate the advancements in science and technology in the medieval period across Asia and Arab countries and decline and revival of science in Europe.
			Explain the scientific approach and its advances of the Europeans and how the role of engineer during the industrial revolution and the major advancements.
			Make use of the advancements in the field of science and technology by adopting new philosophies of 19th and first half of 20th century in finding ethical solutions to the societal problems.
			Interpret the changes in specializations of science and the technology and build the relation between information and society from second half of 20th century onwards.
93.	20MEO03	RESEARCH METHODOLOGIES	Define research problem
			Review and assess the quality of literature from various sources.
			Understand and develop various research designs
			Analyze problem by statistical techniques: ANOVA, F-test, Chi-square.
			Improve the style and format of writing a report for technical paper/Journal report.
94.	20MEO04	ENTREPRENEURSHIP	Understand the concept and essence of entrepreneurship
			Identify business opportunities and nature of enterprise.
			Analyze the feasibility of new business plan
			Apply project management techniques like PERT and CPM for effective planning and execution of projects
			Use behavioral, leadership and time management aspects in entrepreneurial journey.
95.	20ECO05	SYSTEMS AUTOMATION AND CONTROL	Understand the features of various automatic and process control systems.
			Define and analyze various measuring parameters in the industry
			Compare performance of various controllers (P, PD, PI, and PID).
			Illustrate the role of digital computers in automation.
			Develop various robot structures for different applications.
96.	20EEO03	ENERGY AUDITING	Know the current energy scenario and various energy sources
			Understand the concepts of energy auditing
			Evaluate the performance of existing engineering systems
			Explore the methods of improving energy efficiency in different engineering systems
			Design different energy efficient appliances
97.	20EGM01	INDIAN CONSTITUTION AND FUNDAMENTAL PRINCIPLES	Understand the making of the Indian Constitution and its features.
			Identify the difference among Right To equality, Right To freedom and Right to Liberty
			Analyze the structuring of the Indian Union and differentiate the powers between Union and States
			Distinguish between the functioning of Lok Sabha and Rajya


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			Sabha while appreciating the importance of Judiciary. Differentiate between the functions underlying Municipalities, Panchayats and Co-operative Societies
98.	20EGM02	INDIAN TRADITIONAL KNOWELDGE	Understand philosophy of Indian culture Distinguish the Indian languages and literature Learn the philosophy of ancient, medieval and modern India Acquire the information about the fine arts in India Know the contribution of scientists of different eras.
99.	20CSE19	DEVOPS LAB	Understand the phases of the software development life cycle. Examine the different version control systems. Recognize the importance of the build and deployment tools and test the software application Deployment of application in production environment. Summaries the software configuration management. Summaries the software configuration management.
100.	20CSE40	HIGH PERFORMANCE COMPUTING LAB	Apply System Commands and Networking commands of Linux Describe OpenMP constructs and functions. Design and implement parallel programs using OpenMP Apply the APIs in MPI programming. Design and implement parallel programs using CUDA.
101	20CSE39	CYBER SECURITY LAB	Identify the Foot Printing Tools for Information Gathering. Explore the Tools for scanning and scrutinizing the gathered information . Demonstrate the usage of Sniffer Tools. Examine Attack Launching Tools. Analyze the security issues and vulnerability in Email system
102.	20CSE17	ENTERPRISE APPLICATION DEVELOPMENT LAB	Prepare database connections with application servers Design user interfaces using ReactJS Construct strong expertise on Express framework to develop responsive web applications. Create server side applications using Node.js Develop SPA using Angular 2 Invent next culture-shifting web applications
103.	20CAE13	BIG DATA FRAMEWORKS LAB	Understand the significance of bigdata and frameworks associated with it. Implement real-world use cases through hadoop framework. Implement Map reduce programming model Deploy Sqoop and Hive queries Deploy Apache Spark and Apache SQL functionalities. Implement real world applications using NoSQL databases such as MongoDB.
104.	20CAC09	TECHNICAL SEMINAR	Study and review research papers of new field/areas and summarize them Identify promising new directions of various cutting edge technologies in Computer Science and Engineering Impart skills to prepare detailed report describing the selected topic/area Acquire skills to write technical papers/articles for publication. Effectively communicate by making an oral presentation before the evaluating committee
105.	20CAC10	PROJECT PART- 1	Review the literature related to the problem area / selected topic. Undertake problem identification, formulation and solution. Prepare synopsis of the selected topic Gather the required data and Set up the environment for the implementation Conduct preliminary analysis/modelling/simulation experiment. Communicate the work effectively in both oral and written forms.


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106.	20CAI03	INTERNSHIP - III	
107.	20CAE09	PLANNING AND ESTIMATION OF AUTONOMOUS SYSTEMS	<p>Identify different motion planning schemas under different environments</p> <p>Define different states and have mathematical knowledge on different techniques for drop-off and estimation algorithms</p> <p>Analyze different planning and decision techniques</p> <p>Appraise different methods to solve finite Markov decision problem</p> <p>Distinguish different decision making techniques under uncertain environment</p> <p>Apply different information gathering techniques and associate Human-robot interaction</p>
108.	20CAE10	COMPUTATIONAL NEUROSCIENCE	<p>Understand the fundamentals of computational neuroscience</p> <p>Analyse the Neural Encoding Models.</p> <p>Make use of Neurons & Neural coding to extract information</p> <p>Analyse the Computing in Carbon and Computing with Networks</p> <p>Analyze the various learning methodologies</p> <p>Evaluate the Performance of different neurological models</p>
110.	20CSE35	AUGMENTED REALITY AND VIRTUAL REALITY	<p>Explain how the humans interact with computers.</p> <p>Understand the design and implementation of the technologies for AR & VR systems</p> <p>Apply technical and creative approaches to make successful applications and experiences</p> <p>Design audio and video interaction paradigms</p> <p>Understand AR&VR best practices</p> <p>Apply VR/MR/AR in various fields in industry.</p>
111.	20CAE11	NETWORK AND SYSTEM ADMINISTRATION	<p>Identify and examine the system and networking administration tools and commands</p> <p>Describe different addressing and configure DHCP server</p> <p>Configure various services like mail, ftp, web hosting, and security, and use remote administration tools</p> <p>Analyze the DNS server and illustrate the web and proxy server</p> <p>Evaluate and configure the User and system security tools</p> <p>Write scripts to automate the system administration process</p>
112.	20CAE12	Parallel Computing	
113.	20CEM01	ENVIRONMENTAL SCIENCE	<p>Identify the natural resources and realise the importance of water, food, forest, mineral, energy, land resources and affects of over utilisation.</p> <p>Understand the concept of ecosystems and realise the importance of interlinking of food chains.</p> <p>Contribute for the conservation of bio-diversity</p> <p>Suggest suitable remedial measure for the problems of environmental pollution and contribute for the framing of legislation for protection of environment</p> <p>Follow the environmental ethics and contribute to the mitigation and management of environmental disasters.</p>
114.	20EGMO4	GENDER SENSITIZATION	<p>Understand the difference between "Sex" and "Gender" and be able to explain socially constructed theories of identity.</p> <p>Recognize shifting definitions of "Man" and "Women" in relation to evolving notions of "Masculinity" and "Femininity".</p> <p>Appreciate women's contributions to society historically, culturally and politically.</p> <p>Analyze the contemporary system of privilege and oppressions, with special attention to the ways gender intersects with race, class, sexuality, ethnicity, ability, religion, and nationality</p> <p>Demonstrate an understanding of personal life, the workplace, the community and active civic engagement through classroom</p>


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			learning
115.	20CAC11	PROJECT:PART - 2	Demonstrate a sound technical knowledge of their selected topic.
			Design engineering solutions to complex problems utilizing a systematic approach
			Conduct investigations by using research-based knowledge and methods to provide valid conclusions.
			Create/select/use modern tools for the modelling, prediction and understanding the limitation of complex engineering solutions.
			Communicate with engineers and the community at large in written and oral forms.
			Demonstrate the knowledge, skills and attitudes of a professional engineer.



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