

Session: 2026-27 (ODD)

Programme: B.Tech. (Computer Science & Engineering) (AI)

III SEM.

Course Name (Course Code): Data Structures and Algorithms (CAUL301)

CO	Course Outcomes
CAUL301.1	Explain the concept of asymptotic principles for estimating the time complexity of various algorithms.
CAUL301.2	Describe stack and queue with their applications.
CAUL301.3	Apply operations of linked list to solve computational problems.
CAUL301.4	Analyze non-linear data structure algorithms for solving real life problems like shortest path and MST.
CAUL301.5	Compute the efficiency of the principal algorithms for sorting, searching, and hashing.

Course Name (Course Code): Statistics and Probability Theory (MAUL301)

CO	Course Outcomes
MAUL301.1	Understand the basic concepts of Probability, Baye's Law, Bernoulli's trial.
MAUL301.2	Determine probability distributions, expectations, moments, MGF, mean and variances of the discrete and continuous random variables
MAUL301.3	Illustrate different probability distributions like Binomial, Poisson, Normal, Uniform, Exponential Distribution
MAUL301.4	Compute the correlation, regression and best fit curves
MAUL301.5	Apply the concepts of Queuing theory and Markov chain

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Course Name (Course Code): Technical Communication (HSUL302)

CO	Course Outcomes
HSUL302.1	Recall the meaning and characteristics of technical communication.
HSUL302.2	Understand the various techniques for reading technical texts
HSUL302.3	Demonstrate the correct usage of advanced grammar
HSUL302.4	Produce cohesive Letters, E-mails, MOM and Resume
HSUL302.5	Produce Technical Reports and Proposals in proper format

Course Name (Course Code): Foundation of Artificial Intelligence (CAUL302)

CO	Course Outcomes
CAUL302.01	Understand fundamental concepts of AI with intelligent agents and environments.
CAUL302.02	Apply various uninformed and informed search techniques to solve well-defined problems.
CAUL302.03	Analyze different knowledge representation methods and reasoning approaches including propositional and predicate logic.
CAUL302.04	Compare various machine learning paradigms including deep learning and neural networks.
CAUL302.05	Evaluate the ethical implications, biases, and societal impact of Artificial Intelligence applications, proposing strategies for responsible AI development and deployment.

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Course Name (Course Code): Software Engineering and Project Management (CAUL-303)

CO	Course Outcomes
CAUL303.1	Understand the various software development life cycle models and their characteristics
CAUL303.2	Apply requirement elicitation, analysis techniques, and formal specification methods.
CAUL303.3	Illustrate basic UML diagrams to represent software architecture and design.
CAUL303.4	Classify different software testing techniques and various tools for defect detection.
CAUL303.5	Evaluate various software project estimation methods, risk management strategies, and quality assurance practices.

Course Name (Course Code): Digital Electronics (CAUL304)

CO	Course Outcomes
CAUL304.1	Describe the structure of various number systems and codes.
CAUL304.2	Explain the basic logic gates, Boolean algebra and derive digital logic circuits.
CAUL304.3	Apply various boolean expression minimization techniques to obtain optimum logic circuit design.
CAUL304.4	Analyze and design various combinational circuits and sequential circuits.
CAUL304.5	Compare characteristics of various logic families and calculate their parameters.

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Course Name (Course Code): Design and Analysis of Algorithms (CAUL-501)

CO	Outcomes
CAUL501.1	Apply divide and conquer, greedy method and dynamic programming techniques to solve diverse engineering challenges.
CAUL501.2	Apply Branch and Bound, and pattern-matching algorithms to solve complex problems
CAUL501.3	Examine randomized and assignment problems for real-time applications.
CAUL501.4	Categorize problems into the P, NP, NP-Complete, and NP-Hard classes for specific problems.
CAUL501.5	Analyze the time complexity of various algorithms using asymptotic notations.

Course Name (Course Code): Machine Learning CAUL502

CO	Course Outcomes
CAUL502.1	Explain the fundamentals of Machine Learning, data preprocessing techniques, and their real-world applications.
CAUL502.2	Apply supervised learning algorithms for regression and classification, and evaluate performance.
CAUL502.3	Implement unsupervised learning, clustering, and association rule mining techniques for knowledge discovery.
CAUL502.4	Employ feature selection methods and appropriate evaluation metrics to enhance the predictive performance of machine learning models.
CAUL502.5	Analyze feature engineering, dimensionality reduction, and recommendation systems to build efficient machine learning solutions.

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Course Name (Course Code): Automata Theory and Compiler Design (CAUL503)

CO	Course Outcomes
CAUL503.1	Describe the concepts of formal languages, finite automata, regular expressions, major phases of compilers and lexical analysis
CAUL503.2	Illustrate different types of parser designs based on Context-Free Grammar (CFG).
CAUL503.3	Apply Syntax-Directed Definitions (SDDs), syntax trees, and Directed Acyclic Graphs (DAGs) to generate intermediate code and three-address code representations.
CAUL503.4	Classify various storage allocation strategies and data structures used in symbol tables.
CAUL503.5	Analyze various optimization techniques using Control Flow Graphs (CFGs) for generating efficient machine code from source code written in a high-level language.

Course Name (Course Code): Cloud Computing (CAUL504)

CAUL504.1	Understanding the principles and architecture of cloud computing.
CAUL504.2	Apply various cloud service models (IaaS, PaaS, SaaS).
CAUL504.3	Analyze security, privacy and compliance issues in cloud environments.
CAUL504.4	Compare scalable and resilient cloud-based applications.
CAUL504.5	Evaluate economic and business implications of cloud computing solutions.

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Course Name (Course Code): Cryptography and Network Security (CAUL512)

CO	Course Outcomes
CAUL512.1	Understand Security Principles, Attacks, Services and basic cryptographic techniques
CAUL512.2	Apply different Encryption approaches in Modern Block Cipher based Cryptosystems
CAUL512.3	Analyze Authentication secure communication protocols. and their functional components with underlying mathematical principles
CAUL512.4	Examine transport-level and wireless security protocols used in modern communication networks.
CAUL512.5	Evaluate wireless network security and intrusion detection techniques.

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VII SEM.

Course Name (Course Code): Deep Learning and Its Applications (7CAI4-01)

CO	Course Outcomes
7CAI4-01.1	<i>Understand</i> the basic of deep learning algorithms and showcase their applications
7CAI4-01.2	<i>Describe</i> the methodologies of unsupervised training of neural network and activation functions.
7CAI4-01.3	<i>Demonstrate</i> the techniques of Convolution Neural Network architecture and its types.
7CAI4-01.4	<i>Demonstrate</i> appropriate RNN architectures for solving computer vision and sequence modelling problems.
7CAI4-01.5	<i>Demonstrate</i> the autoencoder techniques for feature learning and data representation.

Course Name (Course Code): Environmental Engineering and Disaster Management (7AG6-60.2)

CO	Course Outcomes
7AG6-60.2.1	Demonstrate knowledge of water supply systems by calculating domestic water requirements and selecting suitable sources, intake structures, and conveyance methods for urban and rural areas
7AG6-60.2.2	Examine drinking water quality parameters with reference to Indian Standards and differentiate suitable treatment methods to ensure safe drinking water and sanitation
7AG6-60.2.3	Implement principles of wastewater engineering to determine wastewater quantity, illustrate its characteristics, and choose suitable disposal methods in urban and rural contexts
7AG6-60.2.4	Investigate sewer system requirements, wastewater characteristics, solid waste disposal methods, and air pollution parameters, and test compliance with BIS standards for treatment and abatement.
7AG6-60.2.5	Classify types of disasters, interpret their impacts, and analyze disaster management principles to formulate effective mitigation and preparedness strategies.

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Course Name (Course Code): SODECA (CAUA300)

CO	Course Outcomes
CAUA300.1	Understand the importance of adhering to institutional rules and norms, showcasing respectful and disciplined behaviour in their academic interactions.
CAUA300.2	Demonstrate the ability to leverage technology platforms while integrating technical expertise with project management, effectively balancing technical and resource needs in organizing projects.
CAUA300.3	Analyze practical skills in organizing and participating in cultural and sports events by planning, coordinating, and executing various activities, demonstrating leadership and improving their problem-solving abilities.
CAUA300.4	Develop a sense of responsibility toward community service and actively engage in social outreach programs, contributing positively to societal needs.
CAUA300.5	Build the ability to engage in independent and lifelong learning by continuously acquiring new knowledge, adapting to emerging technologies, and enhancing professional skills to address evolving challenges in the field of technology.

Course Name (Course Code): Data Structures and Algorithms Lab (CAUP320)

CO	Course Outcomes
CAUP320.1	Implement basic data structures including Arrays and Link lists
CAUP320.2	Apply Stack and Queue to solve computational problems
CAUP320.3	Apply searching and sorting techniques to develop efficient solution for computational problems.
CAUP320.4	Analyze various tree traversal techniques and related operations.
CAUP320.5	Analyze graph traversals methods and shortest path algorithms.

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Course Name (Course Code): Programming in Java Lab (CAUP-321)

CO	Course Outcomes
CAUP321.1	Describe object-oriented concepts, java program structure and its installation.
CAUP321.2	Demonstrate Object oriented constructs such as various class hierarchies, interfaces and Packages.
CAUP321.3	Apply String handling technique using String &StringBuffer classes
CAUP321.4	Implement an application involving Thread and Exception handling.
CAUP321.5	Evaluate file handling mechanism for Java applications

Course Name (Course Code): Logic Programming Lab (CAUP322)

CO	Course Outcomes
CAUP322.1	Explain the fundamental concepts of logic programming by modelling relationships and knowledge representation.
CAUP322.2	Implement classical AI problems involving state-space search and rule-based modelling using logical constructs.
CAUP322.3	Apply search algorithms such as BFS and DFS to explore problem-solving approaches.
CAUP322.4	Analyze graph-based problems to determine connectivity, directionality, and structural properties using logic-based methods.
CAUP322.5	Design expert systems for domain-specific problems using logic programming.

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Course Name (Course Code): Digital Electronics Lab (CAUP323)

CO	Course Outcomes
CAUP323.1	Implement basic logic gates using universal gates on a breadboard.
CAUP323.2	Simulate the functionality of digital circuits using VHDL.
CAUP323.3	Analyze various combinational logic circuits (e.g., adders, multiplexers, parity generators) based on boolean expressions in SOP/POS form.
CAUP323.4	Test the sequential circuits (e.g., flip-flops, counters, shift registers) using the logic gate ICs.
CAUP323.5	Create advanced digital systems such as ALU, VHDL-based logic circuits, and mini projects by integrating combinational and sequential building blocks.

Course Name (Course Code): Industrial Training (CAUT-330)

CO	Course Outcomes
CAUT330.1	Interpret fundamental project requirement analysis and make comprehensive use of acquired technical knowledge during the training, to understand industrial processes.
CAUT330.2	Apply theoretical knowledge acquired in academic courses to solve practical problems encountered in real - world scenarios.
CAUT330.3	Demonstrate professional ethics, teamwork, communication, and continuous learning behaviour in the work environment through a compelling presentation that effectively conveys complex information.
CAUT330.4	Analyze user requirements, data flow, or system performance to identify and propose possible improvements.
CAUT330.5	Develop software modules or tools using modern technologies and development platforms, while synthesizing findings into a comprehensive, well-structured report.

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Course Name (Course Code): SODECA (CAUA500)

CO	Course Outcomes
CAUA500.1	Understand the importance of adhering to institutional rules and norms, showcasing respectful and disciplined behaviour in their academic interactions.
CAUA500.2	Demonstrate the ability to leverage technology platforms while integrating technical expertise with project management, effectively balancing technical and resource needs in organizing projects.
CAUA500.3	Analyze practical skills in organizing and participating in cultural and sports events by planning, coordinating, and executing various activities, demonstrating leadership and improving their problem-solving abilities.
CAUA500.4	Develop a sense of responsibility toward community service and actively engage in social outreach programs, contributing positively to societal needs.
CAUA500.5	Build the ability to engage in independent and lifelong learning by continuously acquiring new knowledge, adapting to emerging technologies, and enhancing professional skills to address evolving challenges in the field of technology.

Course Name (Course Code): DAA Lab (CAUP-520)

CO	Course Outcomes
CAUP520.1	Demonstrate graph traversal techniques and Branch and Bound methods to explore solution spaces.
CAUP520.2	Illustrate divide-and-conquer techniques to solve computational problems on various competitive coding platforms.
CAUP520.3	Examine Greedy algorithms to develop optimal solutions for optimization problems on various competitive coding platforms.
CAUP520.4	Analyze Dynamic Programming to solve multi-stage decision problems on various competitive coding platforms efficiently.
CAUP520.5	Analyze the performance of various string pattern matching algorithms.

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Course Name (Course Code): Machine Learning Lab (CAUP521)

CO	Course Outcomes
CAUP521.1	Implement appropriate data preprocessing techniques using standard datasets.
CAUP521.2	Examine supervised machine learning algorithms for solving classification and prediction problems.
CAUP521.3	Compare unsupervised learning techniques for discovering hidden patterns in datasets.
CAUP521.4	Analyze machine learning models using feature processing and validation techniques to improve prediction accuracy.
CAUP521.5	Design machine learning-based solutions for real-world engineering applications.

Course Name (Course Code): Compiler Design Lab (CAUP522)

CO	Course Outcomes
CAUP522.1	Apply various functions of lexical analyzer.
CAUP522.2	Demonstrate the use of lex tool to identify patterns, tokens, and regular expressions for lexical analysis
CAUP522.3	Analyze symbol table management techniques for inserting, deleting, and displaying symbol table entries.
CAUP522.4	Assess the implementation of YACC programs to recognize complex string patterns.
CAUP522.5	Assess the implementation of YACC programs to compute arithmetic expressions

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Course Name (Course Code): Programming for Problem Solving-I (CAUP523)

CO	Course Outcomes
CAUP523.1	Apply programming fundamentals, arrays, strings, and recursion to solve computational problems efficiently.
CAUP523.2	Use linear data structures such as linked lists, stacks, and queues to solve real-world programming problems.
CAUP523.3	Illustrate the process of efficient algorithm design using searching, sorting, hashing, trees, and heap-based data structures.
CAUP523.4	Recommend algorithms by considering paradigms like recursion, backtracking, greedy methods, and graph traversal techniques (BFS/DFS) to solve complex programming problems.
CAUP523.5	Develop programming solutions using programming fundamentals, arrays, strings, and recursion for efficient problem solving.

Course Name (Course Code): Industrial Training (CAUT530)

CO	Course Outcomes
CAUT530.1	Interpret fundamental project requirement analysis and make comprehensive use of acquired technical knowledge during the training, to understand industrial processes.
CAUT530.2	Apply theoretical knowledge acquired in academic courses to solve practical problems encountered in real - world scenarios.
CAUT530.3	Demonstrate professional ethics, teamwork, communication, and continuous learning behaviour in the work environment through a compelling presentation that effectively conveys complex information.
CAUT530.4	Analyze user requirements, data flow, or system performance to identify and propose possible improvements.
CAUT530.5	Develop software modules or tools using modern technologies and development platforms, while synthesizing findings into a comprehensive, well-structured report.

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Course Name (Course Code): SODECA (7CAI8-00)

CO	Course Outcomes
7CAI8-01	Understand the importance of adhering to institutional rules and norms, showcasing respectful and disciplined behaviour in their academic interactions.
7CAI8-02	Demonstrate the ability to leverage technology platforms while integrating technical expertise with project management, effectively balancing technical and resource needs in organizing projects.
7CAI8-03	Analyze practical skills in organizing and participating in cultural and sports events by planning, coordinating, and executing various activities, demonstrating leadership and improving their problem-solving abilities.
7CAI8-04	Develop a sense of responsibility toward community service and actively engage in social outreach programs, contributing positively to societal needs.
7CAI8-05	Build the ability to engage in independent and lifelong learning by continuously acquiring new knowledge, adapting to emerging technologies, and enhancing professional skills to address evolving challenges in the field of technology.

Course Name (Course Code): Deep Learning and Its Applications Lab (7CAI4-21)

CO	Course Outcomes
7CAI4-21.1	Implement deep neural network models for linear regression using single and multiple input variables.
7CAI4-21.2	Implement deep learning techniques for multimedia processing applications.
7CAI4-21.3	Implement Autoencoders and Generative Adversarial Networks (GANs) for handwritten digit reconstruction and generation.
7CAI4-21.4	Analyze the performance of feed-forward neural network models for classification problems.
7CAI4-21.5	Analyze CNN, RNN, and LSTM models for character recognition and image captioning applications.

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Course Name (Course Code): Computer Vision Lab (7CAI4-22)

CO	Course Outcomes
7CAI4-22.1	Explain the concept and Application of image processing for computer vision.
7CAI4-22.2	Illustrate key technologies and implement Histogram processing and Equalization for an image.
7CAI4-22.3	Analyze the Fourier transform for filtering the image.
7CAI4-22.4	Selection of best performing and implementing different methods for image segmentation.
7CAI4-22.5	Design an Image processing application project using YOLO Model online datasets.

Course Name (Course Code): Industrial Training (7CAI7-30)

CO	Course Outcomes
7CAI7-30.1	Interpret fundamental project requirement analysis and make comprehensive use of acquired technical knowledge during the training, to understand industrial processes.
7CAI7-30.2	Apply theoretical knowledge acquired in academic courses to solve practical problems encountered in real - world scenarios.
7CAI7-30.3	Demonstrate professional ethics, teamwork, communication, and continuous learning behaviour in the work environment through a compelling presentation that effectively conveys complex information.
7CAI7-30.4	Analyze user requirements, data flow, or system performance to identify and propose possible improvements.
7CAI7-30.5	Develop software modules or tools using modern technologies and development platforms, while synthesizing findings into a comprehensive, well-structured report.

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Course Name (Course Code): Seminar Lab (7CAI7-40)

CO	Course Outcomes
7CAI7-40.1	Identify the topic in an emerging area and the relevant background literature.
7CAI7-40.2	Analyze research papers and technical information to identify key concepts, methodologies, and recent developments in the chosen domain.
7CAI7-40.3	Evaluate the significance, limitations, and future scope of the selected technology based on critical analysis of the literature.
7CAI7-40.4	Design an effective technical seminar using appropriate presentation techniques.
7CAI7-40.5	Prepare a well-structured technical seminar report and presentation by organizing and synthesizing information from authentic sources.