ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY
Shobavana Campus, Mijar, Moodbidri, D.K – 574225
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Department of Information Science and Engineering

COURSE OUTCOMES FOR ACADEMIC YEAR 2023-24

3rd Semester

CO Numbers	Course Outcomes
BCS301	**Mathematics for Computer Science**
BCS301.1	Explain the basic concepts of probability, random variables, probability distribution
BCS301.2	Apply suitable probability distribution models for the given scenario.
BCS301.3	Apply the notion of a discrete-time Markov chain and n-step transition probabilities to solve the given problem
BCS301.4	Use statistical methodology and tools in the engineering problem-solving process.
BCS301.5	Compute the confidence intervals for the mean of the population.
BCS301.6	Apply the ANOVA test related to engineering problems.

CO Numbers	Course Outcomes
BCS302	**Digital Design and Computer Organization**
BCS302.1	Apply the K–Map techniques to simplify various Boolean expressions.
BCS302.2	Design different types of combinational and sequential circuits along with Verilog programs.
BCS302.3	Describe the fundamentals of machine instructions, addressing modes and Processor performance.
BCS302.4	Explain the approaches involved in achieving communication between processor and I/O devices.
BCS302.5	Analyze internal Organization of Memory and Impact of cache/Pipelining on Processor Performance.

CO Numbers	Course Outcomes
BCS303	**OPERATING SYSTEMS**
BCS303.1	Explain the structure and functionality of operating system
BCS303.2	Apply appropriate CPU scheduling algorithms for the given problem.
BCS303.3	Analyse the various techniques for process synchronization and deadlock handling.
BCS303.4	Apply the various techniques for memory management
BCS303.5	Explain file and secondary storage management strategies.
BCS303.6	Describe the need for information protection mechanisms

CO Numbers	Course Outcomes
BCS304	**DATA STRUCTURES AND APPLICATIONS**
BCS304.1	Explain different data structures and their applications.
BCS304.2	Apply Arrays, Stacks and Queue data structures to solve the given problems.
BCS304.3	Use the concept of linked list in problem solving.
BCS304.4	Develop solutions using trees and graphs to model the real-world problem.
BCS304.5	Explain the advanced Data Structures concepts such as Hashing Techniques and Optimal Binary Search Trees.

CO Numbers	Course Outcomes
BCSL305	**DATA STRUCTURES LABORATORY**
BCSL305.1	Analyze various linear and non-linear data structures
BCSL305.2	Demonstrate the working nature of different types of data structures and their applications
BCSL305.3	Use appropriate searching and sorting algorithms for the give scenario.
BCSL305.4	Apply the appropriate data structure for solving real world problems

CO Numbers	Course Outcomes
BCS306A	**Object Oriented Programming with JAVA**
BCS306A.1	Demonstrate proficiency in writing simple programs involving branching and looping structures.
BCS306A.2	Design a class involving data members and methods for the given scenario.
BCS306A.3	Apply the concepts of inheritance and interfaces in solving real world problems.
BCS306A.4	Use the concept of packages and exception handling in solving complex problem
BCS306A.5	Apply concepts of multithreading, autoboxing and enumerations in program development

CO Numbers	Course Outcomes
BSCK307	**Social Connect & Responsibility**
BSCK307.1	Communicate and connect to the surrounding.
BSCK307.2	Create a responsible connection with the society.
BSCK307.3	Involve in the community in general in which they work.
BSCK307.4	Notice the needs and problems of the community and involve them in problem –solving.
BSCK307.5	Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems.
BSCK307.6	Develop competence required for group-living and sharing of responsibilities & gain skills in mobilizing community participation to acquire leadership qualities and democratic attitudes.

CO Numbers	Course Outcomes
BSCK358D	**Data Visualization with Python**
BSCK358D.1	Demonstrate the use of IDLE or PyCharm IDE to create Python Applications
BSCK358D.2	Use Python programming constructs to develop programs for solving real-world problems
BSCK358D.3	Use Matplotlib for drawing different Plots
BSCK358D.4	Demonstrate working with Seaborn, Bokeh for visualization.
BSCK358D.5	Use Plotly for drawing Time Series and Maps..

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COURSE OUTCOMES FOR ACADEMIC YEAR 2023-24

4th Semester

CO Numbers	Course Outcomes
BCS401	**Analysis & Design of Algorithms**
BCS401.1	Apply asymptotic notational method to analyze the performance of the algorithms in terms of time complexity.
BCS401.2	Demonstrate divide & conquer approaches and decrease & conquer approaches to solve computational problems.
BCS401.3	Make use of transform & conquer and dynamic programming design approaches to solve the given real world or complex computational problems.
BCS401.4	Apply greedy and input enhancement methods to solve graph & string based computational problems.
BCS401.5	Analyse various classes (P,NP and NP Complete) of problems
BCS401.6	Illustrate backtracking, branch & bound and approximation methods.

CO Numbers	Course Outcomes
BIS402	**ADVANCED JAVA**
BCS402.1	Apply appropriate collection class/interface to solve the given problem
BCS402.2	Demonstrate the concepts of String operations in Java
BCS402.3	Apply the concepts of Swings to build Java applications
BCS402.4	Develop web based applications using Java servlets and JSP
BCS402.5	Use JDBC to build database applications

CO Numbers	Course Outcomes
BCS403	**DATABASE MANAGEMENT SYSTEM**
BCS403.1	Describe the basic elements of a relational database management system
BCS403.2	Design entity relationship for the given scenario.
BCS403.3	Apply various Structured Query Language (SQL) statements for database manipulation.
BCS403.4	Analyse various normalization forms for the given application.
BCS403.5	Develop database applications for the given real world problem.
BCS403.6	Understand the concepts related to NoSQL databases.

CO Numbers	Course Outcomes
BCSL404	**Analysis & Design of Algorithms Lab**
BCS404.1	Develop programs to solve computational problems using suitable algorithm design strategy.
BCS404.2	Compare algorithm design strategies by developing equivalent programs and observing running times for analysis (Empirical).
BCS404.3	Make use of suitable integrated development tools to develop programs
BCS404.4	Choose appropriate algorithm design techniques to develop solution to the computational and complex problems.
BCS404.5	Demonstrate and present the development of program, its execution and running time(s) and

CO Numbers	Course Outcomes
BCS405A	**DISCRETE MATHEMATICAL STRUCTURES**
BCS405A.1	Apply concepts of logical reasoning and mathematical proof techniques in proving theorems and statements.
BCS405A.2	Demonstrate the application of discrete structures in different fields of computer science.
BCS405A.3	Apply the basic concepts of relations, functions and partially ordered sets for computer representations.
BCS405A.4	Solve problems involving recurrence relations and generating functions.
BCS405A.5	Illustrate the fundamental principles of Algebraic structures with the problems related to computer science & engineering.

CO Numbers	Course Outcomes
BCSL456D	**Technical Writing using LaTeX**
BCSL456D.1	Apply basic LaTeX command to develop simple document
BCSL456D.2	Develop LaTeX script to present the tables and figures in the document
BCSL456D.3	Illustrate LaTeX script to present theorems and mathematical equations in the document
BCSL456D.4	Develop programs to generate the complete report with citations and a bibliography
BCSL456D.5	Illustrate the use of Tikz and algorithm libraries to design graphics and algorithms in the document

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COURSE OUTCOMES FOR ACADEMIC YEAR 2023-24

5th Semester

CO Numbers	Course Outcomes
21CS51	**AUTOMATA THEORY AND COMPILER DESIGN**
21CS51.1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation
21CS51.2	Design and develop lexical analyzers, parsers and code generators
21CS51.3	Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.
21CS51.4	Acquire fundamental understanding of the structure of a Compiler and Apply concepts automata theory and Theory of Computation to design Compilers
21CS51.5	Design computations models for problems in Automata theory and adaptation of such model in the field of compilers

CO Numbers	Course Outcomes
21CS52	**COMPUTER NETWORKS**
21CS52.1	Learn the basic needs of communication system.
21CS52.2	Interpret the communication challenges and its solution.
21CS52.3	Identify and organize the communication system network components
21CS52.4	Design communication networks for user requirements.

CO Numbers	Course Outcomes
21CS53	**DATABASE MANAGEMENT SYSTEMS**
21CS53.1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS
21CS53.2	Use Structured Query Language (SQL) for database manipulation and also demonstrate the basic of query evaluation.
21CS53.3	Design and build simple database systems and *relate* the concept of transaction, concurrency control and recovery in database

21CS53.4	Develop application to interact with databases, relational algebra expression.
21CS53.5	Develop applications using tuple and domain relation expression from queries.

CO Numbers	Course Outcomes
21CS54	**ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**
21CS54.1	Apply the knowledge of searching and reasoning techniques for different applications.
21CS54.2	Have a good understanding of machine leaning in relation to other fields and fundamental issues and challenges of machine learning.
21CS54.3	Apply the knowledge of classification algorithms on various dataset and compare results
21CS54.4	Model the neuron and Neural Network, and to analyze ANN learning and its applications..
21CS54.5	Identifying the suitable clustering algorithm for different pattern.

CO Numbers	Course Outcomes
21CSL55	**DATABASE MANAGEMENT SYSTEMS LABORATORY WITH MINI PROJECT**
21CSL55.1	Create, Update and query on the database.
21CSL55.2	Demonstrate the working of different concepts of DBMS
21CSL55.3	Implement, analyze and evaluate the project developed for an application.

CO Numbers	Course Outcomes
21CSL581	**ANGULAR JS AND NODE JS**
21CSL581.1	Describe the features of Angular JS.
21CSL581.2	Recognize the form validations and controls.
21CSL581.3	Implement Directives and Controllers.
21CSL581.4	Evaluate and create database for simple application.
21CSL581.5	Plan and build webservers with node using Node .JS.

CO Numbers	Course Outcomes
21CS582	**C# AND .NET FRAMEWORK**
21CS582.1	Able to explain how C# fits into the .NET platform.
21CS582.2	Describe the utilization of variables and constants of C#
21CS582.3	Use the implementation of object-oriented aspects in applications.
21CS582.4	Analyze and Set up Environment of .NET Core.
21CS582.5	Evaluate and create a simple project application.

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COURSE OUTCOMES FOR ACADEMIC YEAR 2023-24

6th Semester

CO Numbers	Course Outcomes
21CS61	**SOFTWARE ENGINEERING & PROJECT MANAGEMENT**
21CS61.1	Understand the activities involved in software engineering and analyze the role of various process models
21CS61.2	Explain the basics of object-oriented concepts and build a suitable class model using modelling techniques
21CS61.3	Describe various software testing methods and to understand the importance of agile methodology and DevOps
21CS61.4	Illustrate the role of project planning and quality management in software development
21CS61.5	Understand the importance of activity planning and different planning models

CO Numbers	Course Outcomes
21CS62	**FULLSTACK DEVELOPMENT**
21CS62.1	Understand the working of MVT based full stack web development with Django.
21CS62.2	Designing of Models and Forms for rapid development of web pages.
21CS62.3	Analyze the role of Template Inheritance and Generic views for developing full stack web applications.
21CS62.4	Apply the Django framework libraries to render nonHTML contents like CSV and PDF
21CS62.5	Perform jQuery based AJAX integration to Django Apps to build responsive full stack web applications.

CO Numbers	Course Outcomes
21IS63	**SOFTWARE TESTING**
21IS63.1	Explain the significance of software testing and quality assurance in software development
21IS63.2	Apply the concepts of software testing to assess the most appropriate testing method.
21IS63.3	Analyze the importance of testing in software development.
21IS63.4	Evaluate the suitable testing model to derive test cases for any given software
21IS63.5	Develop appropriate document for the software artefact.

CO Numbers	Course Outcomes
21CS642	**ADVANCED JAVA PROGRAMMING**
21CS642.1	Understanding the fundamental concepts of Enumerations and Annotations
21CS642.2	Apply the concepts of Generic classes in Java programs
21CS642.3	Demonstrate the concepts of String operations in Java
21CS642.4	Develop web based applications using Java servlets and JSP
21CS642.5	Illustrate database interaction and transaction processing in Java

CO Numbers	Course Outcomes
21ISL66	**SOFTWARE TESTING LABORATORY**
21ISL66.1	List out the requirements for the given problem and develop test cases for any given problem .
21ISL66.2	Design and implement the solution for given problem and to design flow graph
21ISL66.3	Use Eclipse/NetBeans IDE and testing tools to design, develop, debug the Project and create appropriate document for the software artifact.
21ISL66.4	Use the appropriate functional testing strategies. Compare the different testing techniques.
21ISL66.5	Classify and Compare the problems according to a suitable testing model applying the test coverage metrics.

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COURSE OUTCOMES FOR ACADEMIC YEAR 2023-24

7th Semester

CO Numbers	Course Outcomes
18CS71	**ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**
18CS71.1	Appaise the theory of Artificial intelligence and Machine Learning.
18CS71.2	Illustrate the working of AI and ML Algorithms.
18CS71.3	Demonstrate the applications of AI and ML.

CO Numbers	Course Outcomes
18CS72	**BIG DATA AND ANALYTICS**
18CS72.1	Understand fundamentals of Big Data analytics.
18CS72.2	Investigate Hadoop framework and Hadoop Distributed File system.
18CS72.3	Illustrate the concepts of NoSQL using MongoDB and Cassandra for Big Data.
18CS72.4	Demonstrate the MapReduce programming model to process the big data along with Hadoop tools.
18CS72.5	Use Machine Learning algorithms for real world big data.
18CS72.6	Analyze web contents and Social Networks to provide analytics with relevant visualization tools.

CO Numbers	Course Outcomes
18CS731	**SOFTWARE ARCHITECTURE AND DESIGN PATTERNS**
18CS731.1	Design and implement codes with higher performance and lower complexity
18CS731.2	Be aware of code qualities needed to keep code flexible
18CS731.3	Experience core design principles and be able to assess the quality of a design with respect to these principles.
18CS731.4	Capable of applying these principles in the design of object oriented systems.
18CS731.5	Demonstrate an understanding of a range of design patterns. Be capable of comprehending a design presented using this vocabulary.
18CS731.6	Be able to select and apply suitable patterns in specific contexts

CO Numbers	Course Outcomes
18CS744	**CRYPTOGRAPHY**
18CS744.1	Define cryptography and its principles
18CS744.2	Explain Cryptography algorithms
18CS744.3	Illustrate Public and Private key cryptography
18CS744.4	Explain Key management, distribution and ceritification
18CS744.5	Explain authentication protocols
18CS744.6	Tell about IPSec

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8th Semester

CO Numbers	Course Outcomes
18CS81	**INTERNET OF THINGS**
18CS81.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
18CS81.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
18CS81.3	Appraise the role of IoT protocols for efficient network communication.
18CS81.4	Elaborate the need for Data Analytics and Security in IoT.
18CS81.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.

CO Numbers	Course Outcomes
18CS822	**STORAGE AREA NETWORKS**
18CS822.1	Identify key challenges in managing information and analyze different storage networking technologies and virtualization
18CS822.2	Explain components and the implementation of NAS
18CS822.3	Describe CAS architecture and types of archives and forms of virtualization
18CS822.4	Illustrate the storage infrastructure and management activities

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