ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

Shobavana Campus, Mijar, Moodbidri, D.K – 574225
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Department of Computer Science and Design

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

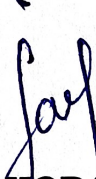| CO Numbers	Course Outcomes
BCS304	DATA STRUCTURES AND APPLICATIONS
BCS304.1	Explain different data structures and their applications.
BCS304.2	Apply Arrays, Stacks and Queue data structures to solve the given problems.
BCS304.3	Use the concept of linked list in problem solving.
BCS304.4	Develop solutions 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
BSCK358A	R Programming
BSCK358A.1	Explain the fundamental syntax of R data types, expressions and the usage of the R-Studio IDE.
BSCK358A.2	Develop a program in R with programming constructs: conditionals, looping and functions.
BSCK358A.3	Apply the list and data frame structure of the R programming language.
BSCK358A.4	Demonstrate working with Seaborn, Bokeh for visualization.
BSCK358A.5	Use visualization packages and file handlers for data analysis.

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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
BCG402	**COMPUTER GRAPHICS AND VISUALIZATION**
BCG402.1	Demonstrate simple algorithms using OpenGL Graphics primitives and attributes.
BCG402.2	Apply mathematical concepts for 2-D and 3-D geometric transformations.
BCG402.3	Make use of OpenGL functions for Interactive Input, GUI and animations.
BCG402.4	Explain clipping algorithms, color models and illumination models.
BCG402.5	Demonstrate visualization of surfaces and 3D objects

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**
BCSL404.1	Develop programs to solve computational problems using suitable algorithm design strategy.
BCSL404.2	Compare algorithm design strategies by developing equivalent programs and observing running times for analysis (Empirical).
BCSL404.3	Make use of suitable integrated development tools to develop programs
BCSL404.4	Choose appropriate algorithm design techniques to develop solution to the computational and complex problems.
BCSL404.5	Demonstrate and present the development of program, its execution and running time(s) and record the results/inferences

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

CO Numbers	Course Outcomes
BBOK407	**BIOLOGY FOR ENGINEERS**
BBOK407.1	Elucidate the basic biological concepts via relevant industrial applications and case studies. 2. 3. 4.
BBOK407.2	Evaluate the principles of design and development, for exploring novel bioengineering projects.
BBOK407.3	Corroborate the concepts of biomimetics for specific requirements.
BBOK407.4	Think critically towards exploring innovative biobased solutions for socially relevant problems.

CO Numbers	Course Outcomes
BUHK408	**Universal Human Values (UHV)**
BUHK408 .1	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
BUHK408 .2	They would have better critical ability.
BUHK408 .3	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
BUHK408 .4	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.

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COURSE OUTCOMES FOR ACADEMIC YEAR 2023-24

5th Semester

CO Numbers	Course Outcomes
21CD51	OBJECT ORIENTED MODELLING AND DESIGN
21CD51.1	Describe the concepts of object-oriented and basic class modelling.
21CD51.2	Draw class diagrams, sequence diagrams and interaction diagrams to solve problems.
21CD51.3	Choose and apply a befitting design pattern for the given problem.
21CD51.4	Translate the requirements into implementation for Object Oriented design.
21CD51.5	Choose an appropriate design pattern to facilitate development procedure.

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 PROJECTS**
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
21RMI56	**RESEARCH METHODOLOGY & INTELLECTUAL PROPERTY RIGHTS**
21RMI56 .1	To know the meaning of engineering research. CO2. CO3. CO 4. CO5.
21RMI56 .2	To know the procedure of Literature Review and Technical Reading.
21RMI56 .3	To know the fundamentals patent aws and rafting pro ceaws and drafting procedure.
21RMI56 .4	Understanding the copyright laws and subject matters of copyrights and designs
21RMI56 .5	Understanding the basic principles of design rights.

CO Numbers	Course Outcomes
21CIV57	**Environmental Studies**
21CIV57.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale.

21CIV57.2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
21CS57.3	Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components.
21CS57.4	Analyze and Set up Environment of .NET Core.
21CS57.5	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

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.

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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
21CS63	COMPUTER GRAPHICS AND FUNDAMENTALS OF IMAGE PROCESSING
21CS63.1	Construct geometric objects using Computer Graphics principles and OpenGL APIs.

21CS63.2	Use OpenGL APIs and related mathematics for 2D and 3D geometric Operations on the objects.
21CS63.3	Design GUI with necessary techniques required to animate the created objects.
21CS63.4	Apply OpenCV for developing Image processing applications.
21CS63.5	Apply Image segmentation techniques along with programming, using OpenCV, for developing simple applications.

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
21CV654	**CONSERVATION OF NATURAL RESOURCES**
21CS654.1	Apprehend various components of land as a natural resource and land use planning.
21CS654.2	Know availability and demand for water resources as applied to India.
21CS654.3	Analyse the components of air as resource and its pollution.
21CS654.4	Discuss biodiversity & its role in ecosystem functioning.
21CS654.5	Critically appreciate the environmental concerns of today.

CO Numbers	Course Outcomes
21ISL66	**COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY**
21ISL66.1	Use openGL /OpenCV for the development of mini Projects.
21ISL66.2	Analyze the necessity mathematics and design required to demonstrate basic geometric transformation techniques.
21ISL66.3	Demonstrate the ability to design and develop input interactive techniques.
21ISL66.4	Apply the concepts to Develop user friendly applications using Graphics and IP concepts.

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