AL SHIFA COLLEGE OF ARTS & SCIENCE
Run By Shifa Medicare Trust & Affiliated to University of Calicut
Keezhattur, Perinthalmanna. Ph: 04933 271 367, 9446 544 473
www.alshifacollegeofartsandscience.ac.in | info@alshifacollegeofartsandscience.ac.in

# Department of Computer Science

## Bachelor of Computer Application Programme Outcome

- Acquire a strong foundation in computer applications, covering programming languages, software development, and IT fundamentals.

- Demonstrate analytical skills to identify, analyze, and solve complex computing problems using logical reasoning and innovative approaches.

- Attain proficiency in designing, implementing, and maintaining software solutions, adhering to industry standards.

- Effectively communicate technical concepts and solutions, fostering collaboration within interdisciplinary teams through both written and verbal means.

- Develop the ability to adapt to evolving technologies and engage in continuous learning to stay relevant in dynamic IT landscapes.

- Equip graduates with the entrepreneurial spirit to explore and pursue self-employment opportunities in the Indian and global software market.

- Adhere to ethical standards and principles in computing, promoting responsible and socially conscious practices in the IT industry.

- Gain skills aligned with industry demands, preparing for entry-level positions in Information Technology and ITES sectors.

- Serve as a solid foundation for higher education pursuits, including MCA, MSc (Computer Science), MSc (IT), MBA, or other Master's Programs.

- Develop a global outlook, understanding the international dimensions of the IT field and ready to contribute to the global software market.

## Course Outcome

### BCA1B01 – Computer Fundamentals and HTML

- Acquire a solid understanding of the fundamentals of computer science to establish a strong foundational knowledge.

- Grasp the basics of computer organization, providing insights into the essential components and their interactions within a computing system.

- Develop the ability to formulate algorithms and create flowcharts for solving simple problems, enhancing problem-solving skills in a structured manner.

- Gain proficiency in the basics of Internet concepts, protocols, and webpage design, enabling students to navigate and contribute to the digital landscape effectively.

### BCA1C02 – Discrete Mathematics

- Demonstrate a comprehensive understanding of mathematical logic and Boolean algebra, essential for logical reasoning in computing.

- Apply mathematical logic principles to analyze and solve complex problems in the context of computer science and information technology.

- Develop proficiency in Boolean algebra, enabling the simplification and manipulation of logical expressions to design and optimize digital circuits.

- Apply mathematical reasoning to formulate and assess the validity of logical statements, contributing to sound decision-making processes in computational contexts.

### BCA1C01 – Mathematical Foundation for Computer Applications

- Gain a solid understanding of the basic principles of linear algebra, including vector operations and their applications in computational contexts.

- Demonstrate proficiency in the fundamental principles of differential and integral calculus, enabling the analysis and modeling of dynamic systems and functions.

- Apply mathematical modeling techniques using ordinary and partial equations to represent and solve real-world problems in diverse fields.

- Develop problem-solving skills by employing linear algebra, calculus, and mathematical modeling, contributing to a well-rounded computational skill set.

### BCA2B02 – Problem Solving Using C

- Acquire a deep understanding of fundamental problem-solving principles for effective analysis and resolution of computing challenges.

- Demonstrate proficiency in programming concepts, showcasing the ability to design and implement logical structures in problem-solving.
- Master the C language, exhibiting the capability to write efficient programs tailored for solving diverse computing problems.
- Cultivate practical problem-solving skills, empowering students to systematically address and resolve simple computing challenges.

**BCA2B03 - Programming Laboratory I: HTML and Programming in C**

- Proficiency in web designing, demonstrated through the creation of responsive and visually appealing websites.
- Hands-on experience in various programming environments to foster adaptability and versatility.
- Application of procedural programming concepts for effective problem-solving.
- Ability to solve mathematical or scientific problems using the C programming language, showcasing computational skills and domain-specific knowledge.

**BCA2C03 – Financial and Management Accounting**

- Establish a fundamental understanding of accounting principles and their versatile applications.
- Develop proficiency in utilizing diverse tools for financial statement analysis.
- Acquire comprehensive knowledge of accounting procedures, including the preparation of various financial statements.
- Cultivate a general awareness of essential tools for effective managerial decision-making.

**BCA2C04 - Operations Research**

- Attain a foundational introduction to solving linear programming problems, covering key concepts and methodologies.
- Develop a general understanding of the network analysis technique and its applications in diverse scenarios.
- Acquire a comprehensive grasp of different mathematical models, enabling analysis and application across various problem-solving contexts.

**A11– Python Programming**

- Understand various statements, data types and functions in Python
- Develop programs in Python programming language
- Understand the basics of Object oriented programming using Python

**A12 - Sensors and Transducers**

The students will be able to

- Explain resistance, inductance and capacitance transducers.
- Perceive the concepts of temperature and pressure transducers.
- Perceive the concepts level transducers such as and flow transducers

- Explain Electromagnetic transducers and radiation sensors
- Explain force and torque transducers and sound transducers

**BCA3B04 – Data Structures Using C**

- Introduce the fundamental concept of data structures, providing students with a solid foundation in their understanding.
- Raise awareness among students about the diversity of data structures, emphasizing their unique characteristics and applications.
- Equip students with the skills necessary to implement fundamental data structures, fostering hands-on experience in building and manipulating these structures.

**BCA3C05- Computer Oriented Numerical & Statistical Methods**

- Understand principles of floating-point arithmetic: precision, rounding, and representation of real numbers in computer systems.
- Develop skills to solve linear equations using methods like substitution, elimination, and matrix operations.
- Acquire knowledge and techniques for numerical differentiation and integration, including finite differences and numerical integration methods.
- Gain foundational understanding of basic statistics: mean, median, mode, variance, and standard deviation.
- Explore fundamentals of probability theory, covering probability distributions, random variables, and key probability concepts.

**BCA3C06 –Theory of Computation**

- Establish foundational knowledge in computer science principles, covering algorithms, data structures, and essential computational concepts.
- Attain a comprehensive understanding of diverse programming languages, including exploration of syntax and semantics.
- Explore theoretical aspects of computer science by studying formal languages, grammars, and automata.
- Apply theoretical knowledge to practical problem-solving, enhancing critical thinking and algorithmic reasoning skills.
- Demonstrate proficiency in designing and analyzing algorithms for solving complex computational problems.
- Model computational processes using formal grammars and automata to comprehend abstract concepts.
- Evaluate and select appropriate programming languages based on task requirements and applications.
- Cultivate effective communication skills to articulate abstract computer science theories.
- Recognize the correlation between theoretical concepts and their real-world applications.
- Foster a lifelong learning mindset, staying updated on emerging technologies in the evolving field of computer science.

**A13– Data Communication and Optical Fibers**

- Understand fundamental principles of data communication systems, including protocols, transmission methods, and network architectures.

- Analyze and design efficient data communication networks considering specific requirements and constraints.
- Demonstrate a comprehensive understanding of optical fiber technology, including components, characteristics, and applications.
- Implement and troubleshoot optical fiber-based communication systems, addressing factors like signal attenuation, dispersion, and noise.
- Evaluate the impact of emerging technologies on data communication and optical fiber systems.
- Apply mathematical and analytical techniques to model and optimize data transmission within optical fiber networks.
- Develop effective communication skills for conveying technical information to diverse audiences.

**A14 - Microprocessors Architecture and Programming**

- Understand the fundamentals of microprocessor internals, encompassing essential principles and components of microprocessor systems.
- Explore the architecture of the 8085 Microprocessor, covering key features, registers, and the flow of data within the system.
- Master the instruction set of the 8085 Microprocessor, gaining proficiency in interpreting and executing assembly language instructions.
- Learn the practical aspects of programming a microprocessor through hands-on exercises and real-world applications.

**BCA4B05 – Database Management System and RDBMS**

- Master the foundational principles of databases, encompassing their purpose, structure, and organization.
- Develop proficiency in the fundamental concepts of Relational Database Management Systems (RDBMS) and their significance in data management.
- Acquire a solid understanding of SQL (Structured Query Language) for efficient database manipulation and retrieval.
- Explore the concepts and applications of PL/SQL (Procedural Language/Structured Query Language) to enhance database functionality and management.

**BCA4B06- Programming Laboratory II: Data Structures and RDBMS**

- Proficiently solve mathematical and scientific problems using C programming with a strong grasp of algorithms.

- Implement diverse data structures (arrays, linked lists, stacks, queues, trees, graphs) through hands-on programming exercises.

- Apply data structure knowledge to address real-life problems, emphasizing practical application of theoretical concepts.

- Develop debugging and optimization skills, prioritizing code quality and performance for scientific and mathematical applications.

- Foster teamwork by collaborating on the design and implementation of complex algorithms, enhancing problem-solving skills in a programming context.

**BCA4C07- E-Commerce**

- Comprehensive introduction to the Electronic Commerce framework, covering fundamental concepts, components, and overall structure.

- Broad understanding of various electronic payment systems, exploring functionalities, security considerations, and impact on modern business transactions.

- General understanding of Internal Information Systems, including their role, structure, and significance in supporting organizational processes and decision-making.

- Exploration of new age information, delving into emerging technologies and trends shaping the information environment, and comprehension of their implications for businesses and individuals

**BCA4C08- Computer Graphics**

- Understand fundamental concepts of computer graphics, including pixels, resolution, and color models.
- Gain proficiency in graphic primitives and basic drawing algorithms.
- Learn the principles of 2D transformations and their application in graphics.
- Explore the basics of 3D graphics, including coordinates, projections, and transformations.
- Understand the role of graphics APIs and libraries in software development.
- Develop skills in raster graphics and image manipulation.
- Explore the fundamentals of computer animation and its application in graphics.
- Gain hands-on experience with graphic software tools and programming languages commonly used in computer graphics.
- Demonstrate the ability to create simple 2D and 3D graphics projects.
- Understand the principles of rendering and shading in computer graphics.
- Explore real-world applications of computer graphics in various industries.

**BCA5B07 - Computer Organization and Architecture**

- Grasp the principles of logic gates and their role in digital circuits.
- Analyze and design combinational circuits for various logical operations.
- Construct and simplify Boolean expressions proficiently.
- Explore the applications and workings of sequential circuits, including flip-flops and registers.
- Understand the basics of computer organization and architecture, including CPU, memory, and I/O devices.

**BCA5B08 - Java Programming**

- Review and master the concepts of Object-Oriented Programming (OOP).
- Gain proficiency in Java Programming Environments, including understanding the IDEs and tools.
- Demonstrate practical programming skills in Java through hands-on exercises and projects.
- Acquire the ability to develop GUI applications using Java, incorporating graphical user interfaces for enhanced user interaction.
- Apply learned concepts and skills to create and optimize GUI applications in Java for real-world scenarios.

**BCA5B09 -Web Programming using PHP**

- Understand the fundamentals of PHP programming language
- Develop dynamic web applications using PHP
- Implement server-side scripting and interactions with databases
- Master the use of PHP for form handling and data processing
- Apply security best practices in PHP web development
- Explore the integration of PHP with HTML, CSS, and JavaScript
- Utilize PHP frameworks for efficient web application development
- Learn about sessions and cookies for user authentication and data persistence
- Troubleshoot and debug PHP code effectively
- Gain proficiency in handling file uploads and downloads in web applications

**BCA5B10 -Principles of Software Engineering**

- Understand fundamental software engineering practices, including version control and collaborative coding.
- Explore Agile, Scrum, and Waterfall methodologies for comprehensive project management knowledge.
- Analyze and apply testing strategies, code quality assessments, and performance evaluations in software development.
- Develop practical skills using tools like Git, JIRA, and CI/CD pipelines for efficient project implementation.
- Evaluate and adapt methodologies to project-specific needs, emphasizing continuous improvement and agile principles.

**BCA6B11- Android Programming**

- Gain a comprehensive understanding of Android programming concepts.
- Familiarize yourself with various Android Programming Environments.
- Develop practical programming skills specific to Android.
- Acquire proficiency in GUI application development on the Android platform using XML.

**BCA6B12- Operating Systems**

- Demonstrate a comprehensive understanding of the objectives and functions of Operating Systems.
- Analyze and describe the life cycle of processes within an Operating System.
- Evaluate and apply various Memory and Scheduling Algorithms in different scenarios.

- Stay updated on the latest developments in Operating Systems, showcasing an overall awareness of the field.

**BCA6B13- Computer Networks**

- Acquire a thorough understanding of transmissions in Computer Networks.
- Demonstrate proficiency in the knowledge and application of various Protocols used in Communication within computer networks.
- Develop a general awareness and basic skills in Network Administration.

**BCA6B14 -Programming Laboratory III: Java and PHP Programming**

- Demonstrate proficiency in Java programming by completing various coding exercises and projects.
- Develop client-side scripting skills through hands-on practice, creating interactive and responsive web interfaces.
- Gain expertise in server-side scripting, implementing functionalities to handle server-side processes and enhance overall website performance.
- Acquire practical knowledge in PHP programming, applying concepts to build dynamic and feature-rich web applications.
- Master the art of developing dynamic websites by integrating client-side and server-side scripting, creating seamless user experiences.
- Practice interacting with databases through PHP, including tasks such as database connectivity, querying, and manipulation of data.

**BCA6B15 -Programming Laboratory IV: Android andLinux Shell Programming**

- Acquire proficient skills in Android programming through hands-on exercises and practical examples.
- Demonstrate mastery in designing and implementing user interface applications for optimal user experience.
- Develop a functional mobile application from concept to completion, showcasing the ability to integrate various Android components.
- Gain practical experience in shell programming, enhancing your proficiency in executing commands and automating tasks on the Android platform.

**BCA6B17-Industrial Visit and Project Work**

- Master the software development life cycle (SDLC), understanding its phases and methodologies.
- Gain proficiency in version control systems, such as Git, for efficient code management.
- Develop hands-on coding skills in languages like Java, Python, or JavaScript.
- Acquire the ability to create clear and concise documentation for effective collaboration.
- Understand and apply software testing techniques, including unit testing and integration testing.

## Elective Papers

### BCA6B16B - Machine Learning

The students will be able to understand machine learning concepts
They also get the essential mathematical and statistical foundations of machine learning

### BCA6B16A -System Software

- Understand fundamental concepts in system software.
- Identify and explain the functions of various system software components.
- Demonstrate knowledge of the compilation process of a program.
- Apply theoretical knowledge to troubleshoot and optimize system software.
- Communicate effectively about system software concepts, both orally and in writing.
- Collaborate with peers to solve real-world problems related to system software.

### BCA6B16C- Software testing & Quality Assurance

- Grasp the fundamental principles of software testing and quality assurance.
- Create comprehensive test plans and test cases for manual and automated testing.
- Effectively identify and prioritize test scenarios based on different SDLC models.
- Demonstrate proficiency in bug tracking, reporting, and management.
- Understand the integration of quality assurance processes into the software development lifecycle.
- Gain practical experience with testing tools and frameworks to enhance the testing process.

### BCA6B16E - Fundamentals of Life Skill Education

- Demonstrate enhanced intra-personal skills through self-reflection and awareness exercises.
- Cultivate inter-personal skills through collaborative activities and effective communication exercises.
- Develop critical thinking abilities by engaging in problem-solving scenarios and analytical discussions.
- Hone decision-making skills through practical case studies and decision-making simulations.
- Enhance communication skills through written and verbal exercises, emphasizing clarity and empathy.
- Establish effective self-management strategies to optimize personal productivity and work-life balance.
- Gain insights into career planning and development through exposure to industry trends, networking opportunities, and goal-setting exercises.

### BCA6B16D - Technical Writing

- Proficient technical communication skills for clear and concise information delivery.
- Mastery of web content writing, creating engaging and SEO-friendly online content.
- Cultivation of essential soft skills for effective collaboration and adaptability.
- Comprehensive understanding and application of search engine optimization (SEO) principles.
- Tailoring communication strategies for diverse audiences to ensure targeted messaging.
- Hands-on experience in crafting compelling narratives for various purposes.

- Problem-solving enhancement through practical exercises and critical thinking development.
- Keen awareness of industry trends and emerging technologies in technical communication and web content creation.