



Sri Bhagawan Mahaveer Jain First Grade College
Geetha Road, Robertsonpet, KGF

Accredited By NAAC B⁺ Grade

Bachelor of Computer Applications

Program Outcomes (POs)

- **PO01: Computational Knowledge:** Understand and apply mathematical foundation, computing and domain knowledge for the conceptualization of computing models from defined problems.
- **PO02: Problem Analysis:** Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer application domains.
- **PO03: Design/ Development of Solutions:** Ability to transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies.
- **PO04: Conduct Investigations of Complex Computing Problems:** Ability to devise and conduct experiments, interpret data and provide well informed conclusions.
- **PO05: Modern Tool Usage:** Ability to select modern computing tools, skills and techniques necessary for innovative software solutions.
- **PO06: Professional Ethics:** Ability to apply and commit professional ethics and cyber regulations in a global economic environment.
- **PO07: Life-long Learning:** Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.
- **PO08: Project Management:** Ability to understand management and computing principles with computing knowledge to manage projects in multidisciplinary environments.
- **PO09: Communication Efficacy:** Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations.
- **PO10: Societal & Environmental Concern:** Ability to recognize economical, environmental, social, health, legal, ethical issues involved in the use of computer technology and other consequential responsibilities relevant to professional practice.
- **PO11: Individual and Team Work:** Ability to work as a member or leader in diverse teams in multidisciplinary environment.
- **PO12: Innovation and Entrepreneurship:** Identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.

PROGRAM SPECIFIC OUTCOMES (PSO)

BCA Regular

- **PSO1:** Pertain current knowledge and adapting to emerging applications of Mathematics, Science fundamentals in the field of Computer science and its applications.
- **PSO2:** Exhibit proficiency in identifying, formulating and analyzing complex problems in the computer environment.
- **PSO3:** Ability to create, select and apply appropriate modern techniques for solving complex issues.
- **PSO4:** Explore technical knowledge in diverse areas of Computer Applications and experience a conducive environment in nurturing skills for successful carrier and higher studies.

COURSE OUTCOMES (COs)

BCA

Semester	Course Code	Course Name	Course Outcomes (COs)
I	BCA103T	Problem Solving Techniques Using C	CO1: Analyse the algorithm and illustrate problem using flowchart. CO2: Apply the concepts of an arrays in real time applications. CO3: Use the functions for various problems. CO4: Solve the problems using pointers and structures. CO5: Illustrate the basic file operations.
I	BCA104T	Digital Electronics	At the end of the course the student should be able to: CO1: examine the structure of number systems and perform the conversion among different number systems CO2: illustrate reduction of logical expressions using boolean algebra, k-map and tabulation method and implement the functions using logic gates CO3: realize combinational circuits for given application CO4: design and analyses synchronous and asynchronous sequential circuits using flip-flops CO5: implement combinational logic circuits using programmable logic devices
I	BCA105T	Discrete Mathematics	CO1: Ability to apply properties of groups, subgroups, cyclic groups, group codes, decoding and hamming matrix to solve problems. And proof of Lagrange's theorem. CO2: Solve counting problems by applying elementary counting techniques using the product and sum rules, permutations, combinations, mathematical induction, the pigeon-hole principle, and binomial expansion. CO3: Ability to apply Solving problems on closure, transitive, hasse diagrams, Warshall's algorithm and partial ordering to solve problems. CO4: Understand vector addition and scalar multiplication, algebraically. CO5: Application of statistics to various fields, Classification and tabulation of data theoretically and graphically with examples, Location of mode using histogram and median.

Semester	Course Code	Course Name	Course Outcomes (COs)
II	BCA203T	Data Structures Using C	<p>CO1: Analyze algorithms and algorithm correctness.</p> <p>CO2: Apply the searching and sorting techniques in real time applications.</p> <p>CO3: Explore concepts on stack and queue operation and its implementation.</p> <p>CO4: Adopt the knowledge of linked list on node of array.</p> <p>CO5: Apply the concepts of trees and its applications.</p>
II	BCA204T	Database Management System (DBMS)	<p>CO1: Explain the basic concept of DBMS, its advantages and applications and to summarize the role of different database users</p> <p>CO2: Illustrate ER - diagram notations for developing the logical design of the database, and to show the conversion of logical design to relational table</p> <p>CO3: Evaluate the different SQL queries on database to create and manipulate relational database, and to illustrate relational algebra</p> <p>CO4: Apply different normalisation techniques on the database by applying the concept of functional dependency/decomposition.</p> <p>CO5: Analyse the concept of transaction processing, discuss different locking protocols and deadlock and recovery management, determine the view and conflict serializability of given schedule.</p>
II	BCA205T	Numerical and Statistical Methods	<p>CO1: Understand the various approaches dealing the data using theory of probability.</p> <p>CO2: Analyze the different samples of data at different level of significance using various hypothesis testing.</p> <p>CO3: Develop a framework for estimating and predicting the different sample of data for handling the uncertainties.</p> <p>CO4: Understand error, source of error and its affect on any numerical computation and also analyzing the efficiency of any numerical algorithm.</p> <p>CO5: Learn how to obtain numerical solution of nonlinear equations using Bisection, Newton – Raphson and fixed-point iteration methods.</p> <p>CO5: Solve system of linear equations numerically using direct and iterative methods.</p> <p>CO6: Understand the methods to construct interpolating polynomials with practical exposure.</p>

Semester	Course Code	Course Name	Course Outcomes (COs)
III	BCA303T	Object Oriented Programming With C++	<p>CO1:Explore the features of concepts in object-oriented programming.</p> <p>CO2:Apply the concepts like class, object and functions in basic programs.</p> <p>CO3:Identify the use of operator overloading and apply inheritance concept for basic problems.</p> <p>CO4:Illustrate the concepts of pointers and virtual functions.</p> <p>CO5:Apply and relate the file operations concepts and its functionalities.</p>
III	BCA304T	Financial Accounting and Management	<p>CO1:Differentiate Trade bills from Accommodation Bills</p> <p>CO2:Understand the concept of Consignment and learn the accounting treatment of the various aspects of consignment</p> <p>CO3:Distinguish Joint Venture and Partnership and to learn the methods of maintaining records under Joint Venture</p> <p>CO4:Distinguish between Single Entry and Double Entry</p> <p>CO5:Know the ascertainment of profit under Single Entry system.</p> <p>CO6:Understand the meaning and features of Non-Profit Organisations</p> <p>CO7:Learn to prepare Receipts & Payment Account, Income & Expenditure Account and Balance Sheet for Non-Profit Organizations.</p>
III	BCA305T	Operating Systems	<p>CO1:Explore the fundamental components of a computer operating system.</p> <p>CO2:Compare and recommend various scheduling algorithms for processes, and solve the deadlock problems.</p> <p>CO3:Recommend the requirement of process synchronization and coordination handled by OS.</p> <p>CO4:Analyze the memory management schemes.</p> <p>CO5:Identify and compare the security and protection mechanisms related to an OS.</p>

Semester	Course Code	Course Name	Course Outcomes (COs)
IV	BCA403T	Visual Programming	<p>CO1:To learn properties and events, methods of controls and how to handle events of different controls.</p> <p>CO2:To understand the use of active controls and how to design VB application To learn connectivity between VB and databases.</p>
IV	BCA404T	Unix Shell Programming	<p>CO1: Explore the basic LINUX commands with its architecture.</p> <p>CO2: Use LINUX file system and different system calls in files.</p> <p>CO3:Analyze the working of processes in LINUX operating system.</p> <p>CO4: Demonstrate the simple shell scripting with VI editor.</p> <p>CO5:Use the system administrative skills in Linux operating system.</p>
IV	BCA405T	Operation Research	<p>CO1:Identify and develop operational research models from the verbal description of the real system.</p> <p>CO2:Understand the mathematical tools that are needed to solve optimisation problems.</p> <p>CO3:Use mathematical software to solve the proposed models.</p> <p>CO4:Develop a report that describes the model and the solving technique, analyse the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.</p>

Semester	Course Code	Course Name	Course Outcomes (COs)
V	BCA501T	Data Communication and Networks	<p>CO1:Describe the functions of each layer in OSI and TCP/IP model.</p> <p>CO2:Explain the network devices and Wireless networking components.</p> <p>CO3:Classify the network routing protocols and analyze how to assign the IP addresses for the given network as well as describe the application layer.</p> <p>CO4:Illustrate the WAN technology and to model the Network operating systems and trouble shooting network.</p>
V	BCA502T	Software Engineering	<p>CO1:Understand the Basics of Software Engineering fundamentals.</p> <p>CO2:Understand the various requirement of Software.</p> <p>CO3:Analyse the concepts of designing and software system.</p> <p>CO4:Analyse the testing and debugging strategy.</p> <p>CO5:Analyse the concepts of software project management.</p>
V	BCA503T	Computer Architecture	<p>CO1:Understand the theory and architecture of central processing unit.</p> <p>CO2:Analyze some of the design issues in terms of speed, technology, cost, performance.</p> <p>CO3:Design a simple CPU with applying the theory concepts.</p> <p>CO4:Use appropriate tools to design verify and test the CPU architecture.</p> <p>CO5:Learn the concepts of parallel processing, pipelining and interprocessor communication.</p> <p>CO6:Understand the architecture and functionality of central processing unit.</p> <p>CO7:Exemplify in a better way the I/O and memory organization.</p> <p>CO8:Define different number systems, binary addition and subtraction, 2's complement representation and operations with this representation.</p>
V	BCA504T	Java Programming	<p>CO1:Demonstrate Clear understanding of Object Oriented Programming paradigm</p> <p>CO2:Demonstrate the Understanding of simplicity, type safe and modularity concepts of Java</p> <p>CO3:Students will be able to develop a model web programming using Applet and developing the interface.</p> <p>CO4:Apply Concept of multi-tasking through Thread/Multi-threading and learning the systems calls of JVM</p> <p>CO5:Illustrate the Query processing throughJava Programming and Understanding of Database and integration with JDBC</p>
			<p>By the end of this course, students will be able to:</p> <p>CO1:Become familiar with the basic components of 8086 instruction set architecture</p> <p>CO2:Inspect and modify 8086 processor registers and memory.</p> <p>CO3:Use assembler to develop and run assembly</p>

v	BCA505T	Microprocessor and Assembly Language	<p>language programs.</p> <p>CO4:Identify registry, memory allocation, memory reference techniques, File processing, modular programming etc</p> <p>CO5:Identify how to interface serial and parallel I/O devices with a microprocessor</p> <p>CO6:Write code to process exceptions and interrupts,</p>
v	BCA506T	Project	<p>CO1: Understand programming language concepts, particularly Java and object-oriented concepts or go through research activities.</p> <p>CO2: Plan, analyze, design and implement a software project or gather knowledge over the field of research and design or plan about the proposed work.</p> <p>CO3: Demonstrate the ability to locate and use technical information from multiple sources.</p> <p>CO4:Demonstrate the ability to communicate effectively in speech and writing.</p> <p>CO5: Learn to work as a team and to focus on getting a working project done on time with each student being held accountable for their part of the project.</p> <p>CO6: Learn about and go through the software development cycle with emphasis on different processes - requirements, design, and implementation phases.</p>

Semester	Course Code	Course Name	Course Outcomes (COs)
VI	BCA601T	Theory of Computation	<p>CO1:able to design Finite Automata machines for given problems</p> <p>CO2:able to analyze a given Finite Automata machine and find out its Language</p> <p>CO3:able to design Pushdown Automata machine for given CF language(s)</p> <p>CO4:able to generate the strings/sentences of a given context-free languages using its grammar</p> <p>CO5:able to design Turing machines for given any computational problem.</p>
VI	BCA602T	System Programming	<p>CO1:To understand the basics of system programs like editors, compiler, assembler, linker, loader, interpreter and debugger.</p> <p>CO2:Describe the various concepts of assemblers and macroprocessors.</p> <p>CO3:To understand the various phases of compiler and compare its working with assembler.</p> <p>CO4:To understand how linker and loader create an executable program from an object module created by assembler and compiler.</p> <p>CO5:To know various editors and debugging techniques.</p>
VI	BCA603T	Cryptography and Network Security	<p>CO1: To Acquire knowledge in security issues, services, goals and mechanism.</p> <p>CO2: To understand the basic concept of Cryptography and Network Security ,their mathematical models.</p> <p>CO3: To evaluate Encryption and decryption of messages using block ciphers. Sign and verify messages using well.known signature generation and verification algorithms.</p> <p>CO4: To Describe and analyze existing authentication protocols for two party communications and Analyze key agreement algorithms to identify their weaknesses.</p> <p>CO5: To Determine the ethical issues related to the misuse of computer security.</p> <p>CO6:To Develop code to implement a new cryptographic algorithm or write an analysis report on any existing security product.</p>
VI	BCA604T	Web Programming	<p>CO1: Explain the history of the internet and related internet concepts that are vital in understanding web development.</p> <p>CO2:Discuss the insights of internet programming and implement complete application over the web.</p> <p>CO3:Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.</p> <p>CO4:Utilize the concepts of JavaScript and Java</p> <p>CO5:Use web application development software tools i.e. Ajax, PHP and XML etc. and identify the environments currently available on the market to design web sites.</p>
VI	BCA505T	Project	<p>CO1: Understand programming language concepts, particularly Java and object-oriented concepts or go through research activities.</p> <p>CO2: Plan, analyze, design and implement a software project or gather knowledge over the field of research and design or plan about the proposed work.</p>

			<p>CO3: Demonstrate the ability to locate and use technical information from multiple sources.</p> <p>CO4: Demonstrate the ability to communicate effectively in speech and writing.</p> <p>CO5: Learn to work as a team and to focus on getting a working project done on time with each student being held accountable for their part of the project.</p> <p>CO6: Learn about and go through the software development cycle with emphasis on different processes - requirements, design, and implementation phases.</p>
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