BACHELOR OF COMPUTER APPLICATION (BCA)

PROGRAMME OUTCOME

At the end of the three year BCA programme the students will be able to:

- An ability to apply knowledge of accountancy, mathematics, computer science and other related topics in practice.
- An ability to enhance not only comprehensive understanding of the theory but its application too in diverse field.
- Understand, analyse and develop computer programs in the areas related to algorithm, web design and networking for efficient design of computer based system.
- Enhance the programming skills of the students, the project within the syllabus has introduced the concept of project development in each language/technology learnt during semester.

PROGRAMME SPECIFIC OUTCOME

- Think in a critical manner.
- Prepare the students for the outside coding world and employable field of computer applications.
- Students will be eligible to pursue higher studies in the area of Computer Applications.
- Students can manage themselves as self-employment in Indian & global software market.
- Meet the requirements of the Industrial standards.

COURSE OUTCOME

SEMSETER – I

BCA-101 (Computer Fundamental & PC Software):

Upon completion of the syllabus, students will be able to:

- Converse in basic computer terminology.
- Formulate opinions about the impact of computers on society.
- Possess the knowledge of basic hardware peripherals.
- Know and use different number systems and the basics of logic gates.
- Solve basic computational problems of number system.
- Know and use the operating system.
- Know and use MS-Office applications.

BCA-102 (Introduction to C Programming):

Upon completion of the syllabus, students will be able to:

- Explore algorithmic approaches to problem solving.
- Ability to analyse a problem and devise an algorithm to solve it.
- Able to formulate algorithms, pseudo codes and flowcharts for arithmetic and logical problems.
- Illustrate the flowchart and design an algorithm for a given problem to develop a C programs using operators.
- Develop conditional and iterative statements to write c programs.
- Exercise user defined functions to solve real time problems.
- Ability to implement algorithms in the 'C' language.

BCA-103 (Mathematics-I):

Upon completion of the syllabus, students will be able to:

- Develop a positive attitude towards mathematics as an interesting and valuable subject of study.
- Get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.
- Ability to analyse a problem, identify and define the computing requirements, which may be appropriate to its solution.
- Learn to solve Diophantine equation.
- Learn to find roots of polynomial over rational.
- Learn to find graphs, roots and primes integer using maxima software.
- Introduction to complex analysis.
- Introduction to vector space and subspace.
- Use computational techniques and algebraic skills essential for the study of systems of Linear equations, matrix algebra, and vector spaces.
- Introduction to analytical geometry of 2 dimensional.
- Finding equation in various form of line, circle, ellipse, sphere, cones etc.

BCA-104 (Principles of Accounting):

Upon completion of the syllabus, students will be able to:

- To give an insight to various basic aspects of accounting and Costing.

- Enables them to understand accounting concepts, tools and techniques influencing business organizations and cost calculation.
- To enable them understand double entry system, accounting procedure maintenance of subsidiary books and final accounts.
- Show proficiency in basic accounting concepts, conventions and understanding of the accounting process.
- Understand the process and preparation of financial statements for Partnership firm and Company and Depreciation charged.

BCA-105 (English Language & Communication):

Upon completion of the syllabus, students will be able to:
- Develop vocabulary and improve the accuracy in grammar.
- Produce words with right pronunciation.
- Improve LSRW- listening, speaking, reading and writing skills and the related sub-skills.

BCA-106 (Software Lab –I (PC Software)):

Upon completion of the syllabus, students will be able to:
- Practical experience on MS-Office.
- Learn to know working with MS-Access.
- Learn about MS-Word, MS-Excel, MS-Power-point.
- Learn to design power point presentation.

BCA-107 (Software Lab –II (Programming in C)):

Upon completion of the syllabus, students will be able to:
- Develop modular programs using control structures and arrays in 'C'.
- Inscribe c programs that use pointers to access arrays, strings and functions.
- Exercise user defined data types including structures and unions to solve problems.
- Inscribe c programs using pointers and to allocate memory using dynamic memory management functions.
- Exercise files concept to show input and output of files in c
- Able to understand the concept of object oriented programming.
- Use the benefits of object oriented design and understand when it is an appropriate methodology to use.
- Design object oriented solutions for small systems involving multiple objects.

BCA-201 (Digital Logic):

Upon completion of the syllabus, students will be able to:

- Apply the principles of number system, binary codes and Boolean algebra to minimize logic expressions
- Discuss Various binary codes- BCD, excess -3, Gray code; Binary arithmetic- addition, subtraction, multiplication and division of unsigned binary numbers.
- Develop K-maps to minimize and optimize logic functions up to 3 variables and 4 variables
- Acquire knowledge about various logic gates and logic families and analyze basic circuits of these families.
- Design various combinational and sequential circuits such as encoders , decoders and counters using multiplexers, and flip – flops
- Understand the concept with the help of circuit diagram of Half adder, full adder, binary magnitude comparator, adder /subtractor circuits, multiplexer and demultiplexer circuits, BCD adder/ subtractor; ALU; parity generators, code converters, priority encoders, PLAs.

BCA-202 (Data Structure with C Language):

Upon completion of the syllabus, students will be able to:

- Understand basic data structures such as arrays, linked lists, stacks and queues.
- Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms.
- Compare alternative implementations of data structures with respect to performance
- Compare and contrast the benefits of dynamic and static data structures implementations.
- Describe the concept of recursion, give examples of its use, describe how it can be implemented using a stack.
- Discuss the principal algorithms for sorting, searching.
- Understand the concept of Dynamic memory management, data types, and algorithms.

- Demonstrate different methods for traversing trees .Solve problem involving graphs, trees and heaps
- Solving problems like sorting, searching, insertion and deletion of data.

BCA-203 (Mathematics-II):

Upon completion of the syllabus, students will be able to:
- Gain Knowledge of fundamental concepts of real numbers.
- Verify the value of the limit of a function at a point using the definition of the limit.
- Introduction to sequence and series.
- Learn to check function is continuous understand the consequences of the intermediate value theorem for continuous functions.
- Student will be to understand differentiation and fundamental theorem in differentiation and various rules.
- Geometrical representation and problem solving on MVT and Rolls theorem.
- Finding extreme values of function.
- Introduction to Ordinary Differential Equation.
- Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases.
- Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution.
- Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.

BCA-204 (Computer Network):

Graduates of the program will have an ability to:
- Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Communicate effectively in a variety of professional contexts.
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

- Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

BCA-205 (Database Management System):

Upon completion of the syllabus, students will be able to:
- Understand what is a DBMS and what it provides.
- Know when to use files and when to use a DBMS
- Understand how data can be encoded and stored in files.
- Can write a program to query large CSV files
- Have a broad understanding of database concepts and database management system software
- Have a high-level understanding of major DBMS components and their function
- Be able to model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model.
- Be able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
- Be able to program a data-intensive application using DBMS APIs.

BCA-206 (Digital Electronics Lab):

Upon completion of the syllabus, students will be able to:
- Have practical experience on Boolean algebra.
- Learn to design logic gates and how they work in system.
- Learn to design both combinational and sequential circuits.
- Idea of chipsets is clearer.

BCA-207 (Software Lab-III(DBMS and Data Structure Lab)):

Upon completion of the syllabus, students will be able to:
- Learn to manage the database practically.
- Learn how to create, insert, delete and modify the database.
- Learn to arrange the elements in proper order.
- Concept of pointer is clearer.

SEMSETER – III

BCA-301 (Operating System):

Upon completion of the syllabus, students will be able to:

- Learn how a computer works.
- Different operating systems used in different electronic goods or gadgets.
- Improve the security of the system.
- Multiple processes can be run parallel in a system.

BCA-302 (Computer Organization and Architecture):

Upon completion of the syllabus, students will be able to:

- Demonstrate computer architecture concepts related to design of modern processors, memories and I/Os.
- Analyze the performance of commercially available computers.
- To develop logic for assembly language programming.

BCA-303 (Object Oriented Programming using C++):

Upon completion of the syllabus, students will be able to:

- Able to understand the use of OOPs concepts.
- Able to solve real world problems using OOP techniques.
- Able to understand the use of abstraction.
- Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
- Understand dynamic memory management techniques using pointers, constructors, destructors ETC.
- Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.
- Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
- Demonstrate the use of various OOPs concepts with the help of programs.

BCA-304 (Mathematics-III):

Upon completion of the syllabus, students will be able to:

- Apply appropriate numerical methods to solve the problem with most accuracy.
- Using appropriate numerical methods determine approximate solution of ODE and system of linear equation.

- Compare different methods in numerical analysis w.r.t accuracy and efficiency of solution.
- Ability to distinguish between random and non-random experiments, knowledge to conceptualise the probabilities of events including frequents and axiomatic approach. Simultaneously, they will learn the notion of conditional probability including the concept of Bayes' Theorem.
- Knowledge of important discrete distributions such as Binomial, Poisson, Geometric, Negative Binomial and Hyper geometric and their interrelations if any.
- Acumen to apply standard discrete probability distribution to different situations.

BCA-305 (UNIX and Shell Programming):

Upon completion of the syllabus, students will be able to:
- Describe the architecture and features of UNIX Operating System and distinguish it from other Operating System.
- Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security, and develop shell scripts to perform more complex tasks.
- Demonstrate UNIX commands for file handling and process control.
- Analyze a given problem and apply requisite facets of SHELL programming in order to devise a SHELL script to solve the problem.
- Understand the significance of the seven fields of the ls – l output.
- Demonstrate changing of file permissions and ownership.
- Explain the shell's interpretive cycle.
- Differentiate between internal and external commands and Illustrate job control commands.
- Demonstrate the use of various grep and sed commands.
- Write a shell script for specific problem definition.
- Employ decision making and looping construct to write a shell script.

BCA-306 (Software Lab-IV (Programming in C++)):

Upon completion of the syllabus, students will be able to:
- Program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.

- Simulate the problem in the subjects like Operating system, Computer networks and real world problems.
- Familiar with the students with OOPs concept.
- Create programs for various real world problems.

BCA-307 (Software Lab-V (UNIX and Shell Program)):

Upon completion of the syllabus, students will be able to:
- Familiar to a different platform, other than Windows.
- Learn shell script.
- Learn how to write scripting.
- Know the difference between Window and LINUX.

SEMSETER – IV

BCA-401 (Software Engineering):

Upon completion of the syllabus, students will be able to:
- Basic knowledge and understanding of the analysis and design of complex systems.
- Ability to apply software engineering principles and techniques.
- Ability to develop, maintain and evaluate large-scale software systems.
- To produce efficient, reliable, robust and cost-effective software solutions.
- Ability to perform independent research and analysis.
- To communicate and coordinate competently by listening, speaking, reading and writing English for technical and general purposes.
- Ability to work as an effective member or leader of software engineering teams.
- To manage time, processes and resources effectively by prioritising competing demands to achieve personal and team goals Identify and analyzes the common threats in each domain.
- Ability to understand and meet ethical standards and legal responsibilities.

BCA-402 (Introduction to Microprocessor):

Upon completion of the syllabus, students will be able to:
- Learn about the history of evolution of Microprocessor.
- Learn about the architecture and programming of the microprocessor 8085 and 8086.
- Learn about the hardware and software model of 8085 and 8086 microprocessor.

BCA-403 (Internet and E-Commerce):

Upon completion of the syllabus, students will be able to:

- Demonstrate the Evolution of Internet.
- Concept of Intranet and Internet, Applications of Internet, Types of Connectivity such as dial – up, leased, VSAT.
- Understand what is a TCP, FTP, Email and what it provides
- Explain WWW Browsers and its feature.
- Analyze the impact of E-commerce on business models and strategy.
- Describe the major types of E-commerce.
- Explain the process that should be followed in building an E-commerce presence.
- Identify the key security threats in the E-commerce environment.

BCA-404 (Java Programming):

Upon completion of the syllabus, students will be able to:

- Explore knowledge of the structure and model of the Java programming language.
- Develop software applications using Java.
- Identify Java language components and how they work together in applications.
- Able to understand the use of OOPs concepts.
- Able to solve real world problems using OOP techniques.
- Able to understand the use of abstraction.
- Able to understand the use of Packages and Interface in java.
- Able to develop and understand exception handling, multithreaded applications with synchronization.

BCA-405 (Computer Graphics):

Upon completion of the syllabus, students will be able to:

- Understand the basics of computer graphics, different graphics systems and applications of computer graphics.
- Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.
- Use of geometric transformations on graphics objects and their application in composite form.
- Extract scene with different clipping methods.
- Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.
- Explore Interaction handling and use of illumination models.

BCA-406 (Software Lab- VI (Java Programming)):

Upon completion of the syllabus, students will be able to:

- Able to design GUI based applications and develop applets for web applications.
- Able to handle IO streams Use and create package and interfaces in a Java program.
- Understand to implement object oriented programming concepts.
- Understand how to design graphical user interface in Java programs.
- Understand how to design and develop applets.
- Able to design User Interface using Swing and AWT.
- Understand concept of packages and study how to implement them.

BCA-407 (Software Lab- VII (Assembly Language Programming (8085), Graphics Programming using C)):

Upon completion of the syllabus, students will be able to:

- Provide comprehensive introduction about computer graphics system, design algorithms and two dimensional transformations.
- Make the students familiar with techniques of clipping, three dimensional graphics and three dimensional transformations.
- Learn a new level of programming language.
- Learn the difference between assembly and high level programming language.

SEMSETER – V

BCA-501 (System Software):

Upon completion of the syllabus, students will be able to:

- Demonstrate the Evolution of Internet the architecture of Intel 8086 – Data and instruction formats – addressing modes – instruction sets – I/O and programming.
- Concept of Language processing activities, Assemblers, two pass assembler.
- understand what is a Macros and Macro processor definition and call
- Explain Loaders, Linker.
- Describe compiler, difference between compiler and interpreter, scanning, symbol table, parsing expression and assignment, control statements, Simple interpreter design.
- Identify Text Editing Process, Types of Editors, User interface, Editor Structure, Interactive Debugging System, Debugging Functions and Capabilities, Relationship with Other Parts of the System, User interface Criteria.

BCA-502 (PHP Programming):

Upon completion of the syllabus, students will be able to:

- Analyse the construction of a web page and relate how PHP and HTML combine to produce the web page.
- Compare and contrast PHP variable types, and relate the advantages and disadvantages of PHP variables with local or global scope.
- Formulate, design and create PHP control structures, including selection and iterative structures.
- Write PHP scripts to handle HTML forms.
- Analyse and solve various database tasks using the PHP language.
- Analyze and solve common Web application tasks by writing PHP programs.

BCA-503 (Python Programming):

Upon completion of the syllabus, students will be able to:
- They can implement real world scenarios in programming.
- They can use Python in various aspects of programming.
- Differentiate between C, C++, JAVA and Python.
- Realize the advantage of using Python.

BCA-504 (Principles of Management):

Upon completion of the syllabus, students will be able to:

1. Relate the basic concepts and technologies used in the field of management information systems

2. Compare the processes of developing and implementing information systems.

3. Translate the role of information systems in organizations, the strategic management processes, with the implications for the management.

4. Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization.

BCA-505 (Intelligent Systems):

Upon completion of the syllabus, students will be able to:
- Students will gain deep understanding of the basic artificial intelligence techniques, Strategies and Actions used to produce the outcome: Learn about artificial intelligence techniques and intelligent systems.

- Students will apply their knowledge to design solutions to different problems. Strategies and Actions used to produce the outcome: Apply artificial intelligence techniques to solve different problems.

- Students will have the ability to design and develop an intelligent system for a selected application. Strategies and Actions used to produce the outcome: Use artificial intelligence technique(s) to design and develop intelligent systems.

BCA-506 (Software Lab- VIII (PHP Programming Lab)):

Upon completion of the syllabus, students will be able to:
- Learn to connect database using PHP.
- Able to do real world project.

BCA-507 (Software Lab- IX (Python Programming)):

Upon completion of the syllabus, students will be able to:
- Able to do real world project.
- Object Oriented Programming concept.
- Apply inheritance.
- Apply polymorphism.

SEMSETER – VI

BCA-601 (Elective – I (Theory of Computation)):

Upon completion of the syllabus, students will be able to:
- To use basic concepts of formal languages of finite automata techniques.
- To design Finite Automata's for different Regular Expressions and Languages.
- To construct context free grammar for various languages.
- To solve various problems of applying normal form techniques, push down automata and Turing Machines.

BCA-602 (Elective – I (Theory of Computation)):

Upon completion of the syllabus, students will be able to:
- Explain the history of the internet and related internet concepts that are vital in understanding web development.
- Discuss the insights of internet programming and implement complete application over the web.
- Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.
- Understand the Microsoft .NET Framework and ASP.NET page structure

- Design web application with variety of controls
- Access the data using inbuilt data access tools
- Use Microsoft ADO.NET to access data in web Application

BCA-603 (Major Project & Viva):

Upon completion of the syllabus, students will be able to:

- They will be able to compete the real world of coding.
- They will learn how the industry works.