



# TRINITY INSTITUTE OF PROFESSIONAL STUDIES

Sector-9, Dwarka, New Delhi-110075

(Affiliated to Guru Gobind Singh Indraprastha University, Delhi &

Approved by Bar Council of India, New Delhi)

“A+” Ranked Institution by SFRC, Govt. of NCT of Delhi

Recognized under section 2(f) of the UGC Act, 1956

Accredited “B++” by NAAC

## BACHELOR OF COMPUTER APPLICATIONS (BCA)

### Course Outcome

### FIRST SEMESTER

#### BCA 101 MATHEMATICS - I

- Learn to solve integrals and differential equations.
- Understand the Concepts of Matrices and linear equations.
- Demonstrate an understanding of relations and functions and be able to determine their Properties.
- Be able to understand logical arguments and logical constructs. Have a better understanding of sets, functions, and relations.
- To provide basic knowledge of statistical techniques as are applicable to business.
- Use the characteristics, data and methods of statistics.

#### BCA 103 TECHNICAL COMMUNICATION

- To have basic understating of the Communication in organizations and importance of formal and informal communication. Explain the proper usage of correct English language.
- To improve oral as well as written communication skills.
- To learn about conducting interviews, formal meeting, project presentations.
- To understand the importance of listening, language and negotiating skills

#### BCA 105- INTRODUCTION TO PROGRAMMING LANGUAGE USING C

- Apply problem solving techniques, design algorithms and flowcharts
- Develop a working knowledge of the C language and its uses, characteristics, and capabilities that can be converted into modular, structured C programs.
- Use libraries of C functions, use arrays and structures to organize data, understand pointers, Read and write data to and from files.

#### BCA 107 FUNDAMENTALS OF INFORMATION TECHNOLOGY

- Understand basic concepts and terminology of information technology, personal computers and their operations.
- Hands-on experience on MS-Word, MS Excel, to create useful spreadsheet applications like tabulated statements, balance sheets, statistical charts, business statements, etc. and

MS PowerPoint package depict the skills in making an effective presentation with audio and video effects.

- Describe flowcharts, block diagrams etc., using the drawing tools available in MS Word or MS Power Point and incorporate them into documents and presentations

### **BCA 109 -PHYSICS**

- Demonstrate a rigorous understanding of the core theories & principles of physics, which includes Laws of Motion, friction, work, energy, power, and electromagnetism, Structure of atom, semiconductor, and transistor.
- Provide knowledge about material properties and its application for developing technology to ease the problems related to the society.
- Comprehend the set of physical laws, describing the motion of bodies, under the influence of system of forces.
- Understand the relationship between particles & atom, as well as their creation & decay, the structure of atoms & subatomic particles.
- Understand different types of energies existing the nature.
- Analyze the applications of mathematics to the problems in physics & develop suitable mathematical method for such application & for formulation of physical theories.

### **BCA 151 C LAB**

- Understand the logic and design a flowchart, and write an algorithm for a given problem.
- Gain experience of procedural language programming, know the steps involved in compiling, linking and debugging the C code.
- Students are made aware about how to use & create their own header files.
- Learn the methods of iteration or looping and branching.
- Make use of different data-structures like arrays, pointers, structures and files.
- Understand how to access and use library functions.
- Learn functions, user defined functions, pointers.
- Write programs to print output on the screen as well as in the files.

### **BCA 153 IT LAB**

- IT Lab focuses primarily on Windows and MS-Office, which will enable the students in crafting professional word documents, PowerPoint presentations, excel etc.
- To Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.
- To familiarize the students in preparation of documents like Resume, Poster, Blog, Tables, Mail merge etc.
- Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future courses.
- To make them acquainted with Excel which is one of the basic tools for data analytics

### **BCA 155 COMMUNICATION SKILLS**

- To enable the learner to communicate effectively and appropriately in real life situation.
- To use English effectively for study purpose across the curriculum.
- To revise and reinforce structure already learnt.
- To develop and integrate the use of four language skills:
  - a) Reading b) Writing c) Listening d) Speaking

- Reading Skills- Ability to read English with understanding and decipher paragraph patterns, writer techniques and conclusions.
- Writing Skills- Skill to develop the ability to write English correctly and master the mechanics of writing the use of correct punctuation marks and capital letter.
- Listening Skills- Ability to understand English when it is spoken in various contexts.
- Speaking Skills- Develop the ability to speak intelligibly using appropriate word stress, sentence stress and elementary intonation patterns.

## SECOND SEMESTER

### BCA 102 MATHEMATICS - II

- Defining sets, relations and functions
- Associating the basic concepts with applications and different operations
- Learning the methods and basics of lattices and graphs and implementing for solutions of different problems.
- Examining degrees of graphs and coloring of graphs.
- Implementing propositional logic for examining the solutions with different operations.

### BCA 104 PRINCIPLES OF MANAGEMENT

- Providing insight about the concept of Management, its principles, Process and levels
- Understand various theories of management and its applicability
- Acquainted about the steps- Planning and organizing in detail
- Aware about the steps involved in management- Staffing, directing and controlling and the various theories associated with them using relevant examples and case studies.
- Develop understanding among students on the need of understanding human behaviors and the models associated with OB.

### BCA 106- DIGITAL ELECTRONICS

- Design any circuit diagram using basic logic gates and Universal gates.
- Implementing & simplifying any Boolean equation using different methods.
- Gain knowledge between different types of number systems, and their conversions.
- Understand, analyze and design various combinational and sequential circuits.
- Designing of conversion circuit from one Flip Flop to another.
- Design different types of counters. Understand the programmable logic devices and various memory devices.

### BCA 108 DATA STRUCTURES USING C

- Understanding the use of basic data structures along with their applications
- To summarize algorithms and algorithm correctness.
- Ability to execute searching and sorting techniques on data
- To implement stack, queue and linked list operation.
- To describe tree and graphs concepts

### BCA 110 –DATABASE MANAGEMENT SYSTEM

- Ability to identify and link user needs and take them into account in the selection, Creation, evaluation and administration of computer-based systems.
- Understand database concepts and structures and query language
- Understand the E R model and relational model
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modelling, designing, and implementing a DBMS.
- Understand Functional Dependency and Functional Decomposition.
- Understand the principles of storage structure and recovery management.

### BCA 152 DS LAB

- Understand the logic write the algorithm for a given problem.
- Learn the methods of iteration or looping and branching.

- Make use of different data-structures like arrays, pointers, structures and files.
- Apply all the concepts that have been covered in the theory course.
- Write programs using basic data structures such as Arrays, Stack, Queue, Link List, Tree, Sorting technique, Searching

#### **BCA 154 DBMS LAB**

- Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.
- Use an SQL interface of a multi-user relational DBMS package to create, secure, populate, maintain, and query a database.
- Formulate query, using SQL, solutions to a broad range of query and data update problems.
- Creating Database and applying its attributes
- Linking relational database with different file system
- Using SQL commands for creating and manipulating database

#### **BCA 156 CYBER ETHICS**

- Students identify and analyze statutory, regulatory, constitutional, and organizational laws that affect the information technology professional.
- Case law and Common law to current legal dilemmas in the technology field.
- Diverse viewpoints to ethical dilemmas in the information technology field and recommend appropriate actions.
- Cases related to cyber security and breaches will be discussed

## **THIRD SEMESTER**

### **BCA 201 MATHEMATICS - I**

- Learn to solve integrals and differential equations.
- Understand the Concepts of Matrices and linear equations.
- Demonstrate an understanding of relations and functions and be able to determine their Properties, when a function is 1-1 and "onto". Able to construct simple mathematical proofs.
- Understand logical arguments and logical constructs. Have a better understanding of sets, functions, and relations.

### **BCA -203 COMPUTER ARCHITECTURE**

- Students will demonstrate knowledge of digital logic analysis and design, instruction execution techniques.
- Understand the theory and architecture of central processing unit.
- Analyze some of the design issues in terms of speed, technology, cost, performance.
- Learn the concepts of parallel processing, pipelining and inter processor communication.
- Understand the architecture and functionality of central processing unit.

### **BCA 205 FRONT END DESIGN TOOLS USING VB.NET**

- Understand .NET Framework and some of the major enhancements to the new version of Visual Basic.
- Describe the basic structure of a Visual Basic.NET project and use features of the integrated development environment (IDE),
- Develop GUI application using form controls and its events
- Learn to use Data Access controls to connect our application to RDBMS and perform data retrieval and manipulation.

### **BCA-207 POA**

- Familiarize students with basic theory, concepts and practice of financial accounting.
- Enable students to explain and apply accounting principles, concepts, conventions and standards.
- Record basic accounting transactions in journal, post them to ledger and prepare and analyze annual financial statements.
- Understand the concept and application of various depreciation methods.
- Understand the meaning of inventory and different methods of inventory valuation.

### **BCA- 209 OBJECT ORIENTED PROGRAMMING USING C++**

- Understand the features of C++ supporting object oriented programming, merits of C++ over C
- Discuss the object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism
- Explain stream I/O, templates and operator overloading
- Improve problem solving skills

### **BCA 251 PROGRAMMING IN VB.NET LAB**

- Design a Window based projects and Console based project using different controls.

- Understand and implementation of Array List, Enumerations and procedures in our project.
- Design Structure and implements structure keyword in VB.Net
- Understand the different types of data connection which used to provide facility to connection between console and window-based application.

### **BCA 253 OOPS USING C++ LAB**

- Understand about class and object in C++.
- Implement constructor and destructor in C++.
- Conceptualize the concept of inheritance.
- Implement File handling
- Understand and Implement a virtual function, templates, functions, constructor, copy constructor, etc.
- Understand and implements templates using a simple program in C++.

### **BCA 255 SOFTWARE DEVELOPMENT SKILLS**

- To learn languages to code front end and back end of a software.
- To initiate into the process of designing, coding and testing a software module.
- To develop a complete software module.
- To apply Software Development Cycle to develop a software module.
- Ability to use the techniques, skills and modern engineering tools necessary for software development.
- Develop a software product along with its complete documentation.

## **FOURTH SEMESTER**

### **BCA 202 MATHEMATICS - IV**

- Understand the Concepts of Permutation and Combination with example.
- Application of Binomial Theorem
- Applications of Probability, Conditional Probability, and Baye's Theorem
- Understand the meaning of Mean & Standard Deviation with examples.
- Discussion of Mathematical Expectation with examples.

### **BCA -204 WEB TECHNOLOGIES**

- Understand the concept and architecture of Internet & www.
- Learning the concepts of Web-site, Search Engines, URLs, Web Portal and Browsers will establish a sound basis of working and execution process of web site.
- Designing and implementing a static web page using various tags along with their attributes in HTML.
- Understand the concept using scripting language JavaScript. Highlighting built in & user defined functions in JavaScript will be helpful in implementing the dynamic webpages validating the data, and handling events.
- Illustrating the benefits of CSS would result in incorporating style sheet in number of webpages.
- Building dynamic website with CSS, DHTML and XML

### **BCA 206 JAVA PROGRAMMING**

- Identify real world problems and finding the possible solutions using object oriented paradigms.
- Interpreting the problems and understand to frame the solutions using java syntax.
- To execute applications using concept of exception handling, multithreaded applications with synchronization.
- To co-relate the concepts and implement the same for developing GUI based applications using AWT and Swing.
- Reflecting the knowledge and also develop socket based applications using java.net package that works on different machines.
- Solve problems by connecting java program with any RDBMS and perform insert, update, delete and select operations.

### **BCA-208 SOFTWARE ENGINEERING**

- Annotating languages to code front end and back end of the software.
- Exemplifying into the process of designing, coding and testing a software module.
- Analyzing a complete software module.
- To apply Software Development Cycle to develop a software module.
- Annotating to use the techniques, skills and modern engineering tools necessary for software development.
- Analyzing a software product along with its complete documentation.

### **BCA- 210 COMPUTER NETWORKS**



- The students will be exposed different types of media, multiplexing, switched networks, the Internet, TCP/IP Suite, fiber-optic communications and the state-of-art networking applications.
- Various transmission media, different topologies, channel error detection and correction, MAC protocols, Ethernet and WLAN.
- Details of IP operations in the Internet and associated routing principles.
- Describe the basis and structure of an abstract layered protocol within a simulated networking environment. Demonstrate an understanding of the significance and purpose of protocols and standards and their key elements and use in data communications and networking.
- Have clear understanding of the basic concepts of data communications including the key aspects of networking and their interrelationship, packet switching, circuit switching and cell switching as internal and external operations, physical structures, types, models, and internetworking.
- Understand the role of digital communications devices in a data communications network.

### **BCA 252 JAVA LAB**

- Understand programming language concepts, particularly Java and object-oriented concepts.
- Write, debug, and document well-structured Java applications
- Implement Java classes from specifications and effectively create and use objects from predefined class libraries
- Understand the behavior of primitive data types, object references, and arrays
- Apply decision and iteration control structures to implement algorithms
- Implement interfaces, inheritance, and polymorphism as programming techniques and apply exceptions handling.
- Apply JDBC to provide a program level interface for communicating with database using java programming.

### **BCA 254 WEB TECHNOLOGIES LAB**

- To learn about various technologies those are used to develop web pages and their layout practically.
- Students will be exploring HTML, the most basic platform and to create static web pages
- Enhancing the look of a webpage using cascading style sheets inclusion into web pages. (CSS), various types of CSS inclusion, implement the CSS inclusion using various selectors.
- Interlinking of webpages. Learn the processing concepts involving scripting language, JavaScript.
- Basic program designing using JavaScript to enhance a webpage with the inclusion of processing capabilities. Function designing in JavaScript.
- Understanding the concept of DHTML and its features. Conversion of a static website into dynamic website.
- Understand XML basics

### **BCA 256 PERSONALITY DEVELOPMENT SKILLS**

- To develop Communication skills and positive personality traits.
- To help students to groom their personality.

- To help students to convey themselves in a mature manner when they interact with people.
- To help students to present in individual or in group class presentations to enhance personality skills.

## **FIFTH SEMESTER**

### **BCA 301 OPERATING SYSTEM**

- To understand basic knowledge of an operating system and its functionalities.
- To understand the services provided by an operating system.
- To understand different types of modern operating system and its applications.
- To understand the difference between process and thread, issues of scheduling of processes and threads.
- To understand the use of locks and semaphores for synchronizing process and threads.
- To understand the concept of deadlock and how to implement them in a multiprogramming environment.
- To understand the concept of memory management and file system.
- To understand the types of I/O management, disk scheduling, protection and security problems faced by operating systems and how to minimize these problems.

### **BCA 303 COMPUTER GRAPHICS**

- Critical understanding of the theory of 2D and 3D transformations, projection and viewing.
- Understanding of how to project figures on screen with the help of coding.
- Understanding graphical curves and clipping.
- Detailed knowledge of the graphics pipeline
- Detailed knowledge of shading and texture mapping algorithms
- Broad knowledge of 3D modeling and rendering techniques
- Ability to understand, design and implement scene graphs

### **BCA 305 E-COMMERCE**

- The core concept of Ecommerce and its types,
- Make students familiarized with technologies for Ecommerce.
- Make them understand different ways of Online Payment systems.
- Understand Selling and marketing on web.
- Familiarize them with the concept of E-business and E-business Revenue generation Models.
- Understand various E-business Strategies.
- Ways of Paying online
- Cyber Securities – Cryptography, SSL, HTTPS, etc.

### **BCA 311 ADVANCED COMPUTER NETWORK**

- Build a network.
- Uses of encoding.
- Creating Links in network.
- Concept of Multicasting.
- Applications of Switching, bridging & Routing.
- Concept of Multiplexing & Demultiplexing.
- Concept of Routing among mobile devices.
- Concept of Cryptography.
- Explain congestion control & congestion control Avoidance mechanisms.
- Methods of intrusion detection.

### **BCA 313 WEB BASED PROGRAMMING (PHP)**

- Design and implement a basic website.
- Implement different navigation strategies.
- Develop simple back-end database and connectivity to support a website.
- Sending query to database, parsing of the query results, checking data errors.
- Files operations on the server.
- Recognize and evaluate website organizational structure and design elements.

### **BCA 351 COMPUTER GRAPHICS LAB**

- To develop best possible figure with closest precision to ideal figure with the help of mathematical algorithms using C language.
- Apply mathematics and logic to develop Computer programs for elementary graphic operations Practical using built in functions as well as creating own functions to generate graphics.
- Generation algorithms and clipping algorithms.
- Develop the competency to understand the concepts related to Computer Vision and Virtual reality
- Apply the logic to develop animation and gaming programs
- 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.
- Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.

### **BCA 355 SUMMER PROJECT/ TRAINING**

- Discover potential research areas in the field of IT. To introduce students to the vast array of literature available of the various research challenges in the field of IT.
- To enable students to create very precise specifications of the IT solution to be designed.
- To create awareness among the students of the characteristics of several domain areas where IT can be effectively used.
- To offer students a glimpse into real world problems and challenges that need IT based solutions.
- Formulate and propose a plan for creating a solution for the research plan identified
- To report and present the findings of the study conducted in the preferred domain

### **BCA 357 MINOR PROJECTS**

- To offer students a glimpse into real world problems and challenges that need IT based solutions
- To enable students to create very precise specifications of the IT solution to be designed.
- Use all concepts of IT in creating a solution for a problem
- Formulate and propose a plan for creating a solution for the research plan identified
- To report and present the findings of the study conducted in the preferred domain
- To improve the team building, communication and management skills of the students.
- Compare and contrast the several existing solutions for research challenge
- Demonstrate an ability to work in teams and manage the conduct of the research study.



## SIXTH SEMESTER

### **BCA 302 DATAWARE HOUSING AND DATA MINING**

- Understand about basic information of a data warehouse and its development.
- Basic conceptual background necessary to design and develop data warehouse applications with dimensional modeling.
- OLAP technology and its various operations.
- Basic data mining principles.
- Identify appropriate data mining algorithms to solve real world problems.
- Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining.
- To understand complex data types with respect to spatial and web mining.

### **BCA 304 MOBILE COMPUTING**

- Applications of wireless communications.
- Uses & Applications of Multiplexing.
- Application of Modulations.
- Concept of Multicasting.
- Applications & descriptions of Spread spectrum.
- Concept of Multiplexing & De-multiplexing.
- Descriptions of near/far & hidden exposed terminal.
- Uses & applications of Aloha.
- Descriptions of Multiple accesses with collision avoidance.
- Applications of GSM: Mobile services, System architecture
- Satellite systems: History, Applications, and Basics: GEO, LEO, MEO, Routing, Localization, Handover.

### **BCA 306 LINUX ENVIRONMENTS**

- Gain extensive knowledge on principles and modules of operating systems.
- Understand key mechanisms in design of operating systems modules.
- Understand process management, concurrent processes and threads, memory management, virtual memory concepts, deadlocks.
- Compare performance of processor scheduling algorithms - produce algorithmic solutions to process synchronization problems.
- Use modern operating system calls such as Linux process and practice with operating system concepts such as process management, synchronization, networked processes and file systems.

### **BCA 312 ARTIFICIAL INTELLIGENCE**

- Identifying Machine intelligence is popularly known as Artificial Intelligence. Choosing Problem, problem space and search. Summarizing the importance of AI, related fields and AI techniques. At last, Comparing Heuristic Search techniques.
- Defining Knowledge and various approaches used in knowledge representation. Using Predicate Logic explaining Facts in logic and computable function.
- Presenting Natural language processing and learning as well as comparing learning techniques
- Presenting Expert system and executing LISP and other AI programming language.

### **BCA 352 LINUX LAB**

- Install a Linux operating system with a custom partitioning scheme and log into and out of a UNIX/Linux computer system using graphical and command line environments.
- Use UNIX/Linux command line (shell) commands to navigate and manage the UNIX/Linux file system, customize the user shell environment, use archiving and compression to back up files.
- Use file name globing and regular expressions to find files and text in the system, manage user and group accounts and permissions, manage processes and jobs, redirect command input and output, schedule processes for execution.
- Install and update software packages using graphical and command line utilities, locate and identify hardware device files in the UNIX/Linux system, configure and manage hardware devices connected to UNIX/Linux system.
- Write shell scripts to automate tasks including decision and repetition structures using a text editor such as vi.

### **BCA 356 MAJOR PROJECT**

- Design and implement a website.
- Implement different navigation strategies.
- Develop back-end database and connectivity to support a website.
- Sending query to database, parsing of the query results, checking data errors.
- Files operations on the server.
- Recognize and evaluate website organizational structure and design elements.

### **BCA 358 SEMINAR**

- Expose the student to the benefits and expectations of academic success.
- Students will be introduced to Research and will be encouraged to write a research paper by the end of the semester.
- Help the student increase self-motivation, personal responsibility, and understanding of his or her role in being an informed participant in the educational process.
- Explain the role of self-efficiency, personal goals, and motivation in improving academic life.
- Describe the behaviors and characteristics of an effective learner.
- Create Self-Awareness Assessment
- Help student increase Grit, Goal Setting, and Motivation