Program Outcomes (POs)

Program Specific Outcomes (PSO)

Course Outcomes (COs)

DEPARTMENT OF COMPUTER APPLICATION

DOON (P.G.) COLLEGE OF AGRICULTURE SCIENCE AND TECHNOLOGY
SELAQUI, DEHRADUN, UTTARAKHAND.

Programme Specific Outcome:-

After complete of BCA Program:

PSO 1. Students gain a sound knowledge of computer science concepts including programming languages such as C, C++ and C#, computer organization and operating system.

PSO 2. Students can create dynamic and interactive web applications because BCA programme cover web technologies such as HTML, CSS, JavaScript and Web development frameworks.

PSO 3. Students learn about database concepts, database design and database management including understanding SQL (Structured query Language) for querying and manipulating database.

PSO 4. Students may become ready for various entry level jobs in the IT industry such software developer, web developer, database administrator and system analyst.

PROGRAMME OUTCOMES (POs)

Upon completion of the BCA program:

PO1. Students gain a solid understanding of fundamental computer science concepts, including programming languages (such as C, C++, and Java), data structures, algorithms, computer organization, and operating systems.

PO2. BCA graduates develop proficiency in programming and software development. They learn to write, debug, and maintain code for various applications and scenarios.

PO3. Students learn about database concepts, database design, and management. This includes understanding SQL (Structured Query Language) for querying and manipulating databases.

PO4. BCA programs often cover web technologies, including HTML, CSS, JavaScript, and web development frameworks. Graduates can create dynamic and interactive web applications.

PO5. Students are exposed to software engineering principles such as software development life cycles, requirements analysis, software testing, and project management.

PO6. BCA graduates develop strong problem-solving and critical-thinking skills, which are essential for identifying and solving technical challenges.

PO7. Students learn about ethical considerations in the field of computing, including issues related to privacy, security, and intellectual property.

PO8. Many BCA programs include group projects that foster teamwork and collaboration, preparing students for real-world work environments.

PO9. Students are prepared for various entry-level roles in the IT industry, such as software developer, web developer, database administrator, system analyst, and more.

PO10. Effective communication is emphasized throughout the program. Graduates are equipped to explain complex technical concepts to both technical and non-technical audiences.

PO11. BCA can serve as a stepping stone for further education, such as pursuing a master's degree in computer science or related fields, to specialize in a specific area of interest.

FIRST SEMESTER

Course: Computer Fundamental

Course Outcome: On successful completion of the course, students will be able to:

1. Understand the concept of hardware and software.
2. Acquainting with input and output devices.
3. Understand networking concepts and models.
4. Learn and aware of Internet activities.

Course: Programming in C

Course Outcome: By the end of this course, students should be able to:

1. Understand the basic programming concepts and syntax of the C language.
2. Design and implement algorithms to solve simple programming problems.
3. Write, compile, and execute C programs using integrated development environments (IDEs).

Course: Internet Technologies

Course Outcome: By the end of this course, students should be able to:

1. Understand the working principles of the internet and its protocols.
2. Develop static web pages using HTML and CSS.
3. Implement interactive features on web pages using JavaScript.

Course: Mathematical Foundation

Course Outcome: By the end of this course, students should be able to:

1. Understand fundamental mathematical concepts and their applications in computer science.
2. Analyze algorithms and data structures using mathematical techniques.
3. Formulate and solve problems in computer science using mathematical modeling.
4. Apply mathematical reasoning to analyze the efficiency and correctness of algorithms.
5. Gain a deeper appreciation of the theoretical underpinnings of computer science

Course: Office Automation

Course Outcome: By the end of this course, students should be able to:

1. Effectively use office automation tools for document creation, presentation, and data analysis.
2. Apply advanced features of office software to optimize office tasks and workflows.
3. Demonstrate effective communication and collaboration skills using office automation tools.

Course: PC Hardware

Course Outcome: By the end of this course, students should be able to:
1. Understand the components and functionality of PC hardware.
2. Assemble, disassemble, and configure computer systems.
3. Identify and troubleshoot hardware-related issues

Course: Life Skills and Personality Development

Course Outcome: By the end of this course, students should be able to:
1. Develop effective communication skills, including active listening and empathetic expression.
2. Enhance emotional intelligence to manage emotions, empathize with others, and navigate social situations.
3. Cultivate resilience and stress management techniques to cope with challenges and setbacks.
4. Master time management and goal-setting, enabling efficient task prioritization and achievement.

SECOND SEMESTER

Course: Object Oriented Programming using C++

Course Outcome: By the end of this course, students should be able to:
1. Understand the fundamental concepts of object-oriented programming.
2. Design and implement C++ programs using classes, objects, and inheritance.
3. Apply polymorphism and templates to develop reusable code.
4. Utilize advanced features of C++ to develop efficient and modular programs

Course: Computer Architecture and Digital Electronics

Course Outcome: By the end of this course, students should be able to:
1. Understand the architecture and organization of a computer system, including the CPU, memory, and I/O devices.
2. Comprehend the basic principles of digital electronics, including logic gates, flip-flops, and combinational and sequential circuits.
3. Analyze and design digital circuits using Boolean algebra and logic gate representations.
4. Explain the functioning of various computer components, such as registers, ALU, control unit, and memory hierarchy.
5. Evaluate the performance of computer systems and understand the trade-offs involved in hardware design.

Course: Computer Based Numerical Techniques

Course Outcome: By the end of this course, students should be able to:
1. Understand the principles and importance of numerical techniques.
2. Apply numerical methods for solving mathematical problems.
3. Implement algorithms for numerical differentiation and integration.
4. Use interpolation techniques for data analysis and approximation.
5. Solve ordinary differential equations numerically.

Course: Linux Environment

Course Outcome: By the end of this course, students should be able to:
1. Be familiar with fundamentals of Linux operating system.
2. To learn the concepts of files and file organization.
3. To learn the mechanisms involved in ownership of files and file attributes
4. To gain the knowledge on vi editor and regular expressions
5. To know the techniques of shell programming.

Course: Cyber Security

Course Outcome: By the end of this course, students should be able to:
1. Remember the broad set of technical, social & political aspects of Cyber Security.
2. Understand the importance of ethical hacking, its tool and ethical hacking process.
3. Analyse security principles to system design.
4. Understand the methods for authentication, access control, intrusion detection and prevention in Cyber Security

Course: Business Intelligence

Course Outcome: By the end of this course, students should be able to:
1. Understand the fundamentals of business intelligence and data analytics.
2. Analyze and interpret data using business intelligence tools and techniques3. Design and develop data warehouses and data marts.
3. Apply data visualization techniques to present insights effectively.
4. Understand the ethical and legal considerations in business intelligence.

Course: Understanding and Connecting with Environment

Course Outcome: By the end of this course, students should be able to:
1. Develop a deep understanding of environmental concepts, ecosystems, and biodiversity.
2. Implement sustainable practices for responsible resource management and waste reduction.
3. Analyse the interconnectedness of species and ecosystems within the natural world.
4. Evaluate and address environmental issues such as climate change and habitat destruction.
5. Cultivate a sense of environmental responsibility and engage in ethical decision-making for sustainable living.

THIRD SEMESTER

Course: Data Structure & File Organization

Course Outcome: By the end of this course, students should be able to:
1. Understand the concepts of data structures and their importance in computing.
2. Implement and use common data structures such as arrays, linked lists, stacks, queues, trees, and graphs.
3. Analyze the time and space complexity of algorithms related to data structures.
4. Apply data structures to efficiently solve real-world problems.

Course: Operating System

Course Outcome: By the end of this course, students should be able to:
1. Understand the basic concepts and components of operating systems.
2. Explain the functionalities and mechanisms of process management in an operating system.
3. Understand memory management techniques and algorithms.
4. Demonstrate knowledge of file systems and file management in an operating system.
5. Understand the principles of device management and I/O operations in an operating system.

Course: Python Programming

Course Outcome: By the end of this course, students should be able to:
1. Understand the basics of programming language
2. Develop, document, and debug modular Python programs.
3. Apply suitable programming constructs and built-in data structures to solve a problem.
4. Use and apply various data objects in Python.
5. Use classes and objects in application programs and handle files.

Course: Modelling and Simulation

Course Outcome: By the end of this course, students should be able to:

1. Understand the concepts and principles of modelling and simulation.
2. Design and develop simulation models using appropriate simulation software or programming languages.
3. Apply statistical analysis techniques to evaluate simulation results.
4. Analyze and interpret simulation output to make informed decisions.
5. Apply modelling and simulation techniques to solve real-world problems in different domains

Course: Graph Theory

Course Outcome: By the end of this course, students should be able to:

1. Understand the fundamentals of graph theory and its terminology.
2. Analyze and represent problems using graph models.
3. Apply graph algorithms to solve problems such as shortest paths, minimum spanning trees, and network flows.
4. Apply graph theory concepts to solve real-world problems in different domains.
5. Understand the applications of graph theory in computer science, operations research, and other fields.

Course: Informatics Cyber laws

Course Outcome: By the end of this course, students should be able to:

1. Understand the legal frameworks and regulations governing cyberspace.
2. Identify and analyse legal issues related to information technology.
3. Evaluate the ethical implications of information technology practices.
4. Apply security measures to protect information systems and data.
5. Develop an understanding of the legal rights and responsibilities of individuals and organizations in cyberspace.

Course: Indian Knowledge System-I

Course Outcome: By the end of this course, students should be able to:
1. Define and explain the concept and scope of Indian Knowledge System (IKS).
2. Evaluate the contributions of renowned Indian scholars to philosophy, literature, mathematics, astronomy, medicine, yoga, and other disciplines.
3. Analyze ancient Indian literature, including Vedas, Upavedas, Puranas, and Upanishads, for insights into cultural and philosophical heritage.
4. Investigate the socio-cultural linkages between traditional, tribal, and ethnic communities and their knowledge systems.
5. Examine myths, rituals, spiritual practices, and belief systems as integral components of Indian culture.

FOURTH SEMESTER

Course: Computer Network

Course Outcome: By the end of this course, students should be able to:
1. Understand the fundamentals of data communication and networking concepts.
2. Analyze and design network architectures and topologies.
3. Configure and troubleshoot network devices and protocols.
4. Apply network security measures to protect data transmission.
5. Understand emerging trends and technologies in data communication and networks

Course: Database Management System

Course Outcome: By the end of this course, students should be able to:
1. Understand the concepts and principles of database management systems.
2. Design and create relational databases using SQL.
3. Query and manipulate data using SQL commands.
4. Apply normalization techniques to ensure data integrity.
5. Understand the principles of database administration and security.

Course: R Programming

Course Outcome: By the end of this course, students:
1. be able to use and program in the programming language R
2. be able to use R to solve statistical problems
3. be able to implement and describe Monte Carlo the technology
4. be able to minimize and maximize functions using R

Course: System Administrator

Course Outcome: By the end of this course, students should be able to:
1. Understand the roles and responsibilities of a system administrator.
2. Configure and manage operating system environments.
3. Implement security measures to protect system resources.
4. Perform system maintenance and troubleshooting tasks.
5. Apply best practices for system administration in different operating systems

Course: Software Testing

Course Outcome: By the end of this course, students should be able to:
1. Understand the importance of software testing in the software development life cycle.
2. Apply different testing techniques and methodologies.
3. Design and execute test cases to verify software functionality.
4. Identify and report software defects effectively.
5. Understand the role of automated testing tools in software testing.

Course: Software Engineering

Course Outcome: By the end of this course, students should be able to:
1. Understand the principles and practices of software engineering.
2. Apply software engineering processes and methodologies to develop software systems.
3. Perform requirements analysis and software design.
4. Implement software using appropriate programming languages and development tools.
5. Apply software testing and quality assurance techniques.

FIFTH SEMESTER
Course: Compiler Design

Course Outcome: By the end of this course, students should be able to:
1. Explain the phases of compilation and their role in transforming source code.
2. Define context-free grammars and construct parse trees.
3. Perform semantic analysis to catch programming errors.
4. Apply optimization techniques to improve code efficiency.
5. Implement code generation for various target architectures.

Course: Computer Graphics

Course Outcome: By the end of this course, students should be able to:
1. Understand the fundamentals of computer graphics and its applications.
2. Design and render 2D and 3D graphics using appropriate tools and libraries.
3. Implement graphics algorithms for transformations, rasterization, and shading.
4. Apply computer graphics concepts in interactive applications and virtual environments.
5. Analyse and optimize graphics performance in real-time applications.

Course: Multimedia Application

Course Outcome: By the end of this course, students should be able to:
1. Understand the concepts and components of multimedia technology.
2. Design and develop multimedia content using appropriate tools and techniques.
3. Integrate various multimedia elements such as text, images, audio, and video.
4. Apply multimedia technologies in interactive applications and presentations.
5. Evaluate and optimize multimedia content for different platforms and devices.

Course: ASP.Net

Course Outcome: By the end of this course, students should be able to:
1. To learn fundamentals of. net framework
2. To enrich knowledge about Windows Forms, Controls and ASP.NET based applications.
3. To acquire skills to create web-based applications and Reports using.net technologies

Course: Pattern Recognition

Course Outcome: By the end of this course, students should be able to:
1. Identify areas where Pattern Recognition and Machine Learning can offer a solution.
2. Describe the strength and limitations of some techniques used in computational Machine Learning for classification, regression and density estimation problems
3. Describe genetic algorithms, validation methods and sampling techniques
4. Describe and model data to solve problems in regression and classification
5. Implement learning algorithms for supervised tasks.

Course: SQL/PL-SQL

Course Outcome: By the end of this course, students should be able to:
1. Understand the fundamentals of SQL and relational database management systems.
2. Write SQL queries to retrieve, update, and delete data from databases.
3. Use SQL to create and modify database tables, views, and indexes.
4. Develop PL/SQL programs for procedural database operations.
5. Apply database optimization techniques using SQL and PL/SQL.

SIXTH SEMESTER

Course: Cryptography & Network Security

Course Outcome: By the end of this course, students should be able to:
1. Understand the principles and concepts of network security.
2. Identify potential security threats and vulnerabilities in networked systems.
3. Implement security measures to protect network infrastructure.
4. Apply encryption and authentication techniques to secure network communication.
5. Analyze and respond to security incidents in networked environments.

Course: Design and Analysis of Algorithm

Course Outcome: By the end of this course, students should be able to:
1. Understand the fundamentals of algorithm analysis and design.
2. Analyse the time and space complexity of algorithms.
3. Apply algorithmic techniques to solve computational problems.
4. Design and implement efficient algorithms for real-world scenarios.
5. Evaluate and compare different algorithmic approaches for problem solving.

Course: E-Commerce

Course Outcome: By the end of this course, students should be able to:
1. Understand the fundamentals of e-commerce and its impact on business.
2. Analyze and evaluate different e-commerce models and technologies.
3. Design and develop e-commerce websites and applications.
4. Apply security and privacy measures in e-commerce systems.
5. Understand the legal and ethical considerations in e-commerce.

Course: Image Processing

Course Outcome: By the end of this course, students should be able to:
1. Identify the fundamental elements of an image and describe the need of digital image processing.
2. Understand different types of image transformation techniques and their properties.
3. Use various noise models and calculate the values for restoration and degradation models.
4. Analyze and evaluate various image compression techniques.
5. Integrate and Demonstrate various Image Transformation and Segmentation Techniques

Course: Parallel Programming

Course Outcome: By the end of this course, students should be able to:
1. Solve the Problems in Parallel
2. Have knowledge on Different Structures of Parallel Computers
3. Understand the Performance Evaluation of Parallel Computers
4. Get acquaintance on CUDA
5. Develop Parallel Programs in CUDA C

Course: Data Compression

Course Outcome: By the end of this course, students should be able to:
1. To gain a fundamental understanding of data compression methods for text, images, and video, and related issues in the storage, access, and use of large data sets
2. To select, giving reasons that are sensitive to the specific application and particular circumstance, most appropriate compression techniques for text, audio, image and video information
3. To illustrate the concept of various algorithms for compressing text, audio, image and video information.
4. To understand various Distortion criterions.
5. To illustrate the Advantages of Vector Quantization over Scalar Quantization.