

# UTTARANCHAL UNIVERSITY, DEHRADUN

*Arcadia Grant P.O.Chandanwari, Premnagar, Dehradun*

Uttaranchal Institute of Management

**DEPARTMENT OF COMPUTER APPLICATION**

**BACHELOR OF COMPUTER APPLICATION (BCA)**

## **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)**

- PEO 1** Create value to organizations as an EMPLOYEE at various levels, by improving the systems and processes using appropriate methods.
- PEO 2** Apply modern tools and techniques to solve complex real time problems
- PEO 3** Run an organization successfully with good social responsibility as an ENTREPRENEUR, making use of the knowledge and skills acquired from the programme.
- PEO 4** To inculcate professionalism, ethical attitude, communication skills, team work in their profession and enhance their skills for life-long learning.
- PEO 5** Produce the professionals or the future to become the backbone and will participate for the rapid growth.

## **PROGRAM OUTCOMES (POs)**

- PO1** Understanding of basic Computer Application concepts and principles that aims to prepare young minds for the challenging opportunities in the IT industry.
- PO2** Determine, explicate and analyze real time problems using fundamental concepts of Computer Science and relevant domains.
- PO3** Design and develop solutions to meet software requirements in various domains like banking, insurance, healthcare, multimedia and mass communication, etc. using latest technologies.
- PO4** Able to write reports, design documentation and make impressive presentations by learning technical communication skills.

- PO5** Use critical thinking and creativity skills to solve complex problems using modern tools and techniques in ethical way.
- PO6** Acquire project-based learning skills such as define the problem, identify alternative solutions, plan the project, execute the plan, monitor & control the project progress and finally complete the project.
- PO7** To product employable IT workforce, that will have sound knowledge of IT and business fundamentals
- PO8** Enhance competitive skills, prepare for higher education, and engage in independent and lifelong learning in the broadest context of technological change.

## **COURSE WISE -Course Outcomes (CO)**

### **BCA-C101: Fundamental of Information Technology**

#### **Course Outcomes (CO)**

- CO1. Understand the elementary concepts of computers systems and associated software and hardware components.
- CO2. Summarize the functioning of associated software system that establishes linkage between internal and external components coupled with the computer systems.
- CO3. Summarize the basic concepts of digital electronics that acts as the foundation for the logic behind digital computer systems.
- CO4. Build word documents as per requirement by extensive use of tools available in the application. Apply the knowledge acquired for content creation and construction.
- CO5. Design presentations and analyze data for related activities with respect to particular functional area.

### **BCA-C102: Programming in 'C'**

#### **Course Outcomes (CO)**

- CO1. Understand the basic concepts of C language and develop programming skills.
- CO2. Develop Analytical / Logical Thinking and Problem Solving capabilities.
- CO3. Design algorithm using concepts of Computer and Information Technology to formulate programs for the real time problems
- CO4. Develop sound technical knowledge of programming to enhance employability
- CO5.** Apply the concept of C programming using critical thinking and creativity skills to solve complex problems.

### **BCA-A103: Technical Communication**

#### **Course Outcomes (CO)**

- CO1. Acquire in-depth knowledge of the communication, apply for effective correspondence with team and critically understand the requirements or real-time technical problems for which solution can be designed thus creating a ground for future learning.
- CO2. Demonstrate critical understanding, thinking and writing ability by making an optimum use of correct vocabulary & grammar thus identify alternative solutions for technical or business issues
- CO3. Enhance the writing skills, learn the writing process (prewriting/writing/rewriting) and apply them to design and develop appropriate technical and workplace documentation.
- CO4. Acquire skills to modify body language and use ethically sound verbal/non-verbal skill, while interaction or making presentations to create an impact on the audience thus enhances employability
- CO5. Develop listening and impressive speaking skills, demonstrating professional, ethical and public-facing attributes for an entrepreneurs or executives of different cultural backgrounds and utilize appropriate formats and conventions derived from individual disciplines.

### **BCA-A104: Mathematical Foundation of Computer Science**

#### **Course Outcomes (CO)**

- CO1. Ability to apply knowledge of mathematics, science, and engineering to solve practical problems.
- CO2. Analyze a problem and identify and define the computing requirements for solution.
- CO3. Acquire ability to describe computer programs (e.g. recursive functions) in a formal mathematical manner.
- CO4. Ability to express and analyze logic sentence in terms of predicates, quantifiers, and logical connectives.
- CO5. Apply the technical knowledge to generating the function and recurrence relations to solve the problems

### **BCA-C151: PC Packages Lab**

#### **Course Outcomes (CO)**

- CO1. Examine the connection of various hardware components of computer system and its peripherals. Implement and identify the interaction between various hardware and software components.
- CO2. Apply and implement significant internal and external DOS commands to understand their functionality.
- CO3. Apply significant concepts of text editing in the application software.
- CO4. Apply and analyze numerical data pertaining to some mathematical problem to aid in problem solving using application software.
- CO5. Demonstrate and develop effective presentations using application software.

### **BCA-C152: Programming in 'C' Lab**

#### **Course Outcomes (CO)**

- CO1. Illustrate C programming development environment, compiling, debugging, linking and executing a program using the development environment.
- CO2. Infer the familiarity with basic Computer Application concepts and formulate algorithm for the real time problems
- CO3. Apply and practice logical formulations to design and develop solutions to complex problems.
- CO4. Design the required programming components that efficiently solve computing problems in real world.
- CO5. Rephrase the acquired technical communication skills in the form of documentation of the carried out lab work.

### **BCA-S153: Mini Project I**

#### **Course Outcomes (CO)**

- CO1. Define the problems in various domains that can be solved using computer applications.
- CO2. Develop the ability to identify alternative solutions and plan the project.
- CO3. Analyze and Design the software development process.
- CO4. To develop coding and testing skills for software development.
- CO5. Build technical presentation skills and Create project documentation of the complete process.

### **BCA-V105: Hygiene and Environmental Health**

#### **Course Outcomes (CO)**

- CO1. Understand the basic principles and concepts of hygiene and environmental health.
- CO2. Summarize the landmarks of historical development in the field of environmental health, hygiene and sanitation.
- CO3. Identify the link between environmental health and hygiene.
- CO4. Assess importance of personal hygiene with respect to public health.
- CO5. Analyze the contribution of human waste disposal, drinking water supply and water pollution, and solid waste management in affecting human and environmental health.

### **BCA-C201: Data Structure Using ‘C’**

#### **Course Outcomes (CO)**

- CO1. Understand the basic concepts of Data Structures and programming skills.
- CO2. Determine, explicate and analyze problems using fundamental concepts of Computer Science and develop algorithms to solve the problem.
- CO3. Illustrate and compare various tools and techniques for algorithms and programming.
- CO4. Acquire sound knowledge of data structure techniques to enhance the employability status.
- CO5. Build skills in designing algorithms for various applications to enhance competitive skills and lifelong

### **BCA-C202: Object Oriented Programming using C++**

#### **Course Outcomes (CO)**

- CO1. Understand the basic concepts of programming and formulate the algorithms and implement the solutions for mathematical problems.
- CO2. Identify the real-world problem and suggest the solutions to the persist problem by C++ OOPs concepts.
- CO3. Design and develop the reusable application using inheritance in C++ and apply modern tools to develop applications for various domains using inheritance.
- CO4. Demonstrate critical thinking to develop robust applications using pointers and polymorphism in C++.
- CO5. Ability to demonstrate technical skills to solve the IT industry problem with various C++ concepts and enhance the ability to learn new things.

### **BCA-C203: Software Engineering**

#### **Course Outcomes (CO)**

- CO1. Design /Development and compose a software product with the software engineering lifecycle model and demonstrating its competence in planning and developing software.
- CO2. Students are able to analyze and identify the software requirement specification and software matrices. So that efficient software can be developed.
- CO3. Demonstrate an understanding of and apply current theories, models, and techniques of software engineering to bring out innovative and novelistic solutions for the growth.
- CO4. The potential to develop software engineering capabilities skills to improve technological expertise and employability.
- CO5. Demonstrate the basic principles and relevance of project management software principles such as cost estimating, scheduling, and analyzing the progress that helps to enhance employability.

### **BCA-A204: Environmental Science**

#### **Course Outcomes (CO)**

- CO1. Understand the significance of environment & its natural resources, and identify their responsibility as citizens, consumers and environmental actors in complex interconnected environmental systems.
- CO2. Demonstrate critical thinking to plan innovative strategies for environmental protection, biodiversity conservation and sustainable development, and facilitate life-long learning.
- CO3. Elaborate the knowledge of the environmental challenges associated with air and noise pollution, solid waste management, and disaster management.
- CO4. Build critical understanding of the major problems associated with water pollution, its sources and impacts on human and ecosystem health.
- CO5. Reflect critically about the consequences of human actions on the environment, its subsequent impacts on human health & welfare, and take part in finding their solutions by appraising the latest environmental policies.

### **BCA-C251: Data Structure Using 'C' Lab**

#### **Course Outcomes (CO)**

- CO1. Infer the familiarity with algorithms and basic concepts of Data Structures and programming skills.
- CO2. Infer the familiarity with basic concepts of Function, Array and Link-list and formulate algorithm for problems.
- CO3. Apply and practice logical formulations of Stack, Queues, Trees and various Sorting and searching algorithm designs and develop solutions to complex problems.
- CO4. Design new algorithms that efficiently solve computing problems in real world.
- CO5. Rephrase the acquired technical communication skills in the form of documentation of the carried out lab work.

### **BCA-C252: Programming using C++Lab**

#### **Course Outcomes (CO)**

- CO1. Understand the working of C++ IDE with the fundamentals concepts of programming and implement the solution for mathematical problems.
- CO2. Develop and implement solutions for various problems using OOPs concepts like Class, objects
- CO3. Analysis and implement the reusable applications using inheritance.
- CO4. Learn to create the solutions of complex applications using pointers and polymorphism in C++ programming
- CO5. Enhance technical knowledge to design console based applications to solve complex mathematical and business problems using file handling, , exception handling and template programming.

### **BCA-S253: Mini Project II**

#### **Course Outcomes (CO)**

- CO1. Define the problems in various domains that can be solved using computer applications.
- CO2. Develop the ability to identify alternative solutions and plan the project.
- CO3. Analyze and Design the software development process.
- CO4. To develop coding and testing skills for software development.
- CO5. Build technical presentation skills and Create project documentation of the complete process.

### **BCA-V205: Disaster Management**

#### **Course Outcomes (CO)**

- CO1. Understand basic concepts in disasters, hazards, vulnerability, risk and their management approaches.
- CO2. Understand approaches of disaster risk reduction, disaster management cycle and phases and the relationship between vulnerability, disasters, disaster prevention and risk reduction.
- CO3. Demonstrate the knowledge about institutional and legal processes, regulations and acts for disaster risk management in India.
- CO4. Inspect some historic disaster case studies from India to find the linkage between disasters and development.
- CO5. Assess the contribution of international institutions (such as UNISDR, USAD, UNDAC) to provide funds for public health management during a disaster

### **BCA-C301: Database Management Systems**

#### **Course Outcomes (CO)**

- CO1. Understand the vital concepts of database management system and its architecture.
- CO2. Summarize the significance of database management system over traditional file based system.
- CO3. Understand the concept of database normalization and its significance.
- CO4. Comprehend the transaction processing and recovery concepts.
- CO5. Understand the concept of concurrency control and Serializability in the context of database management system.

### **BCA-C302: Web Technologies**

#### **Course Outcomes (CO)**

- CO1. Understand the fundamental of web technology, internet protocols and web development tools using web development collaboration and team dynamics.
- CO2. Learn to create static web pages by analyzing the existing problems in real time environment using font tags, list tags, table tags, frame tags, form tags & anchor tags.
- CO3. Develop the web designing skills using CSS and learn the programming concept of client side scripting using JavaScript.
- CO4. Implement the server side scripting on the web application using PHP.
- CO5. Develop technical knowledge of database connectivity and validation of web application through MySQL, PHP and JavaScript so that student can meet the current industry, academic and research requirement.

### **BCA-C303: Data Warehouse and Data Mining**

#### **Course Outcomes (CO)**

- CO1. Understand the fundamental concepts, advantages, limitations and significance related to data warehouse.
- CO2. Understand the models for the data warehouse development and allied components.
- CO3. Understand the concepts of OLAP which later on can be applied in specific problem areas.
- CO4. Develop critical thinking skills to select a set of feasible techniques for domain specific data mining.
- CO5. Outline the prominent sub domains of web data mining and text data mining.

### **BCA-C304: Computer Based Optimization Techniques**

#### **Course Outcomes (CO)**

- CO1. Understand and apply the concept of optimization and classification to solve practical optimization problems.
- CO2. Knowledge of applying evaluation optimization technique in engineering applications.
- CO3. Apply the technical knowledge and critical thinking to model engineering minima/maxima problems as optimization problems.
- CO4. Apply the technical and critical thinking to integrate various resources for optimization in the industry as well as for strategic utilization of IT-enabled services and functions.
- CO5. Apply the Queuing Models techniques to solve the real world problem and also develop the skills to identify the solution of the optimization problem.

### **BCA-C351: Database Management Systems Lab**

#### **Course Outcomes (CO)**

- CO1. Demonstrate the concepts of creation of tables, views and indexes.
- CO2. Demonstrate the concept of keys and constraints on the tables.
- CO3. Illustrate the concept of data and structure manipulation.
- CO4. Demonstrate the use of various aggregate functions in SQL on data.
- CO5. Illustrate the data segregation using various operators in SQL.

### **BCA-C352: Web Technologies Lab**

#### **Course Outcomes (CO)**

- CO1. Understand the concepts of basic html tags like list tags, table tags, frame tags, form tags to develop the static web pages
- CO2. Enhance the view of web pages through web designing techniques using CSS.
- CO3. Learn the basic concepts of client side scripting and various validations constructs using JavaScript.
- CO4. Learn the fundamental concepts of server side scripting and basic programming concepts using PHP.
- CO5. Develop technical knowledge of database connectivity and validation of web application through MySQL, PHP and JavaScript so that student can meet the current industry, academic and research requirement.

### **BCA-S353: Mini Project III**

#### **Course Outcomes (CO)**

- CO1. Identify the requirement aspects of a project for problem solving.
- CO2. Able to choose appropriate software engineering process model.
- CO3. Understand the different project feasibility and requirement and create SRS reports for project.
- CO4. Choose, Illustrate and apply appropriate software tools and programming languages.
- CO5. Apply software metrics for testing, verification and validation of project

### **BCA-C401: Operating System and Linux**

#### **Course Outcomes (CO)**

- CO1 Illustrate the fundamentals of operating systems component and demonstrate its functionalities using Linux commands.
- CO2 Describe the operating system resources and its management techniques.
- CO3 Compare and illustrate various process scheduling algorithms.
- CO4 Apply appropriate memory and file management schemes.
- CO5 Summarize the concepts of Linux operating system and implement Shell programming.

### **BCA-C402: Theory of Computation**

#### **Course Outcomes (CO)**

- CO1 Understand and apply acquired fundamental knowledge of Theory of Computation to formulate various models/machine for solving real time mathematical problems.
- CO2 Apply concepts of formal computation and its relationship with languages to evaluate the validity of any token in a programming language through designed DFA or N DFA model/machine
- CO3 Classify and critically evaluate various types of ambiguous and non-ambiguous grammar and thus analyse, formulate the syntax of various programming languages through designing solutions using Push Down Automata.
- CO4 Critically analyse the mathematical problem and Design solution to solve it using Turing Machine.
- CO5 Evaluate the mathematical problem on solvability, decidability, finiteness and provide solution to PCP problems.

### **BCA-C403 : Computer Networks**

#### **Course Outcomes (CO)**

- CO1 Understand and apply acquired fundamental knowledge of digital data communication techniques and its standards.
- CO2 Determine, explicate and analyze problems using fundamental concepts of Computer Networks and suggest new ways to solve the problem.
- CO3 Inspect the various concepts of network topologies, components and categories of networks to enhance the employability status.
- CO4 Make use of the concepts of OSI layers, functions and its protocols to examine challenges in Computer Networks.
- CO5 Build skills in Computer Networks to enhance competitive skills and lifelong learning in the broadest context of technological change

### **BCA-C404 : Programming in JAVA**

#### **Course Outcomes (CO)**

- CO1 Understand the basic concepts of programming and formulate the algorithms to implement the basic programs and prepare young minds to face the challenges in the IT industry
- CO2 Identify the real-world problem and suggest the solutions to the persistent problem by rapid software development using Java inheritance and packages
- CO3 Design and develop complex GUI application using Java Applet, AWT, with multithreading mechanism
- CO4 Develop event-driven GUI applications using various modern Java techniques like Swing, event handling
- CO5 Apply technical skills to solve the IT industry problems and enhance the employability of the students.

### **BCA-C451:Linux Lab**

#### **Course Outcomes (CO)**

- CO1 Ability to identify the basic Linux general-purpose commands.
- CO2 Apply and change the ownership and file permissions using advanced Linux commands.
- CO3 Use the pwd, Sed,grep,chmod,sudo etc.
- CO4 Implement and execute shell scripts.
- CO5 Analyze and apply various tasks of administrator.

### **BCA-C452:Programming in JAVA Lab**

#### **Course Outcomes (CO)**

- CO1 Understand the working of Java IDE with the fundamentals concepts of programming to develop basic programs
- CO2 Develop real world programs using Java packages, interfaces and various OOPs concepts to solve complex problems.
- CO3 Analysis of the critical problems in the real-time environment and able to develop Network supported applications using RMI and multithreading.
- CO4 Implement portable GUI applications with enrich graphics using java Swing to solve real world problems
- CO5 Develop technical knowledge to design GUI applications with database support to meet the current industry, academic requirements using JDBC and Swing.

### **BCA-S453:Mini Project IV**

#### **Course Outcomes (CO)**

- CO1 Enhance the presentation and communication skills of an individual by project presentation to face a prospective technical interview and able to create technical documentation of the required project.
- CO2 Enhance project-based learning skills, such as to define the problem, identify alternative solutions, plan the project, execute the plan, monitor and control the project progress for successful designing and completion using software engineering designing tools like DFD, UML, pert chart and Gantt chart.
- CO3 Develop the critical analysis skills so that student will able to apply various testing tools like Unit testing, System testing, Black Box texting, Alpha testing and Beta testing techniques on the project.
- CO4 Produce Entrepreneurs who can analyze the problem and develop customized solution using programming language for small to large enterprises.
- CO5 Enable the Students to design and develop short research projects in a team using technical knowledge of Software Engineering.

### **BCA-C501:Computer Graphics and Animation**

#### **Course Outcomes (CO)**

- CO1 Understand the basic concepts, Algorithm and Disciplinary knowledge of Computer Graphics using OpenGL.
- CO2 Understand the 2D Geometric Primitives and construct the different shapes using OpenGL.
- CO3 Design and implement Algorithms in OpenGL to draw Objects, Clipping, Scan conversion and Filling of basic Objects in 2D Transformations.
- CO4 Understand and explore the different approaches in Computer Animation.
- CO5 Be capable of using OpenGL to create interactive Computer Graphics.

### **BCA-E502:Cyber Security**

#### **Course Outcomes (CO)**

- CO1 Understand the fundamental concept of cyber security like cyber threats, challenges in internet governance, categories of cyber crimes and able to analyze the cyber attack through cyber security tools.
- CO2 Able to analyze and determine software security and vulnerabilities solutions to reduce the risk of exploitation.
- CO3 Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.
- CO4 Able to design and develop security architecture for an organization.
- CO5 Able to implement various computer cyber security tools and methods to reduce risk of cyber attacks.

### **BCA-E503:Digital Marketing**

#### **Course Outcomes (CO)**

- CO1 Understand the fundamental of concepts of digital marketing and impact of implementing and applying digital marketing principles for organization.
- CO2 Understand the SEO fundamentals, process and implementing SEO techniques for Google search , page optimization by identification of keywords and analyzing of keyword search, which leads to good employability scope.
- CO3 Recognize the social media marketing fundamentals, identify the goals, and achieve goals by implementing social digital marketing.
- CO4 Develop understating concept of email marketing, formulate solutions for data capturing offline/online and implement Ad formats, Ad Display, Ad Campaigns after identification of problem.
- CO5 Understand mobile digital marketing techniques like SMS content, developing Mobile responsive websites and apply them to solve marketing problem.

### **BCA-E504: Enterprise Resource Planning**

#### **Course Outcomes (CO)**

- CO1 Understand the basic concepts, problem analysis, different Modules and Packages of Enterprise Resource Planning.
- CO2 Identify the steps and activities in the ERP life cycle and be able to design the ERP life cycle stages for any new and existing system.
- CO3 To understand the OLAP and OLTP operations and develop strategic Business Database.
- CO4 Understand the basic concepts of Data Warehouse, Data Mine, Business Process Reengineering, Supply Chain Management, and Decision Support System for successful ERP implementation to meet the current industry requirement.
- CO5 Development and Analysis of ERP Implementations in focusing the various issues through Soft System approaches for present global and Indian market scenario.

### **BCA-E505: Advance Web Technologies**

#### **Course Outcomes (CO)**

- CO1 To combine web technologies like java script, document object model, to create AJAX application.
- CO2 To apply JSON technology with website to transit and fetch data over the internet.
- CO3 To develop rich applications with the integration of Web API and Java Script object notation.
- CO4 To create effective application with the help of session management techniques.
- CO5 To design web application to manipulate data using PHP and My Sql.

### **BCA-E506: Advance JAVA**

#### **Course Outcomes (CO)**

- CO1 Understand the basic concepts of Advance Java for solving the real-life problem in various multidisciplinary setups using Java Servlets
- CO2 Implement the solutions for the existing problem with rapid Web Application development technique using Java Server Pages
- CO3 Implement enrich graphic supported application using JavaFx to apply for solving real world problems
- CO4 Design and develop MVC supported Web applications using java Struts
- CO5 Design and Develop scalable, secure Web-based applications as per the current industry requirements with various frameworks t. And enhance the opportunities for employability of the students.

### **BCA-E507:Mobile Computing**

#### **Course Outcomes (CO)**

- CO1 Demonstrate and analyze the principles, theories, and importance of mobile computing technologies to enhance employability.
- CO2 Demonstrate the technology, infrastructures and facilities of mobile computing and able to evaluate the solution to solve mobile computing problem.
- CO3 Identify the applications in different domains that mobile computing offers to the public, society, and businesses so the employability can enhance.
- CO4 Demonstrate the possible future aspects of mobile computing technologies and their applications and able to develop the technical skill to handle mobile computing issues.
- CO5 Compare the different aspects of the routing algorithm and develop the learning skills to face the challenges in mobile computing.

### **BCA-E508:Cloud Computing**

#### **Course Outcomes (CO)**

- CO1 Understand the Cloud Computing Architecture, characteristics, benefits of cloud computing and core issues such as security, privacy, and interoperability and apply these concepts in cloud infrastructures to understand the tradeoffs in power, increase efficiency and reduce cost.
- CO2 Understand and compare the various levels of services that can be achieved by cloud and create flexible and scalable infrastructures.
- CO3 Analyze and understand the various Cloud Platforms used in Industry and apply them to solve problems in the market on cloud.
- CO4 Understand and compare the various Scientific, Business and Consumer Applications of Clouds, to select best solution for the existing problem in the Industry.
- CO5 Understanding of when and where to use and providing sufficient foundations to enable further study and research using the appropriate industry models.

### **BCA-C551:Computer Graphics and Animation Lab**

#### **Course Outcomes (CO)**

- CO1 Understand the basic concepts, Algorithm and Disciplinary knowledge of Computer Graphics using OpenGL.
- CO2 Understand the 2D Geometric Primitives and construct the different shapes OpenGL.
- CO3 Design and implement algorithms in OpenGL to draw Objects, Clipping, Scan conversion and Filling of basic Objects in 2D transformations.
- CO4 Learn to create animation application and implement the different approaches in Computer Animation using OpenGL.
- CO5 Be capable of using OpenGL to create and solve interactive Computer Graphics.

### **BCA-E552:Advance Web Technologies Lab**

#### **Course Outcomes (CO)**

- CO1 To illustrate GET and POST request processing by using AJAX technology and JQuery.
- CO2 To solve complex business logics by using Object oriented programming concepts in PHP.
- CO3 To combine AJAX , DOM and advance javascript to manipulate CSS and DOM contents.
- CO4 To demonstrate use of web API , JSON functionality to create modern web applications.
- CO5 To solve real world problems by developing interactive web applications using various web technologies and be prepared for IT industry.

### **BCA-E553:Advance JAVA Lab**

#### **Course Outcomes (CO)**

- CO1 Understand the working of Java IDE with the advance concepts of programming and implement web applications using Servlets
- CO2 Design and develop web applications using rapid web development technologies like Java Server Pages.
- CO3 Learn to create console based enrich graphic application and apply them for solving real world problems using JavaFx
- CO4 Analysis of the critical problems in the real-time environment and able to design Web application using Java struts with validations
- CO5 Develop technical knowledge to design and implement dynamic web applications to meet the current industry requirements using the Spring Framework.

### **BCA-S554:Mini Project V**

#### **Course Outcomes (CO)**

- CO1 Enhance the presentation skills and student will learn to create proper documentation of the project
- CO2 Understand various project planning strategies using pert chart and giant chart and to develop the critical analysis for real time problems using feasibility analysis technique.
- CO3 Understand the project designing construct using software engineering designing tools like DFD and UML diagrams.
- CO4 Develop the critical analysis skills so that student will able to apply various testing tools like unit testing, system testing, black box testing, alpha testing and beta testing techniques on the project.
- CO5 Produce entrepreneurs who can develop customized solution for small to large enterprises.

### **BCA-C601:Project**

#### **Course Outcomes (CO)**

- CO1 Enhance the presentation skills and student will learn to create proper documentation of the project
- CO2 Understand various project planning strategies using pert chart and giant chart and to develop the critical analysis for real time problems using feasibility analysis technique.
- CO3 Understand the project designing construct using software engineering designing tools like DFD and UML diagrams.
- CO4 Develop the critical analysis skills so that student will able to apply various testing tools like unit testing, system testing, black box testing, alpha testing and beta testing techniques on the project.
- CO5 Produce entrepreneurs who can develop customized solution for small to large enterprises.

### **BCA-C602:Seminar**

#### **Course Outcomes (CO)**

- CO1 Demonstrate the ability to perform close and critical readings
- CO2 Understand literature survey, presentation and communication skills
- CO3 Identify and comprehend main ideas, supporting ideas and details.
- CO4 Understand and identify the advantages, limitations and applications of specific topic.
- CO5 Demonstrate an understanding of topic-specific and general academic vocabulary.

### **BCA-C603:.NET Framework and Technologies**

#### **Course Outcomes (CO)**

- CO1 Understand the basic concept of programming. To develop problem analysis and problem solving skills for real time problem using .NET framework technology.
- CO2 Identify and analyze the existing problems in real time environment and develop the new solution using the programming concept using .net framework technology.
- CO3 Develop critical thinking, analytical skills to develop new window and web application for existing problems using .net framework technology.
- CO4 Implement validation controls on web based application using ASP.NET validation, standard and rich controls.
- CO5 Develop technical knowledge of ADO.net, Asp.net and window programming so that student can meet the current industry, academic and research requirement

### **BCA-E604:ANDROID App Development**

#### **Course Outcomes (CO)**

- CO1 Understand basic concept of Object Oriented Programming Concepts & Java Fundamental.
- CO2 Understand and implement the concept of Android SDK, Android application framework, android runtime, Android lifecycle.
- CO3 Develop android app using Text controls, Images, Button controls, supporting multiple screens.
- CO4 Develop code in XML and learn the application development life cycle.
- CO5 Enhance the development skills of student to create mobile application using UI layouts: Predefined android layouts, linear layout, grid view, relative layout, table layout, absolute layout, frame layout, list view, layout attributes.

### **BCA-E605:Programming using Python**

#### **Course Outcomes (CO)**

- CO1 To enhance the ability to solve problems using system approaches, critical and innovative thinking, and technology to create solutions.
- CO2 Understand the purpose and the process of code in python.
- CO3 Understand the object oriented paradigm in python program.
- CO4 Acquire project skills in core python.
- CO5 Design and analyze text processing, networking and implement database access in python using various python libraries.

### **BCA-C651:.NET Framework and Technologies Lab**

#### **Course Outcomes (CO)**

- CO1 Understand the working of visual studio IDE with the fundamentals concepts of programming using C# .NET.
- CO2 Understand the fundamentals of Object oriented programming and apply to create console application using C#.net.
- CO3 Analysis the critical problems of the real time environment and able to design new windows application using windows programming constructs through c#.net.
- CO4 Learn to create web application and implement validation controls on web-based application using ASP.NET validation, standard and rich controls.
- CO5 Develop technical knowledge of ADO.net, Asp.net and window programming so that student can meet the current industry, academic and research requirement

### **BCA-E652:ANDROID App Development Lab**

#### **Course Outcomes (CO)**

- CO1 Understand the object oriented programming concept and apply to develop android application using exception handling.
- CO2 Understand the Android development environment, Android SDK, Android application framework, android runtime, Android lifecycle to develop the android mobile application.
- CO3 Develop android application using Text controls, Images, Button controls, supporting multiple screens.
- CO4 Understand the concept of broad casting and develop and android application creating and registering the broadcasting receiver.
- CO5 Develop android application using UI layouts: pre-defined android layouts, linear layout, grid view, relative layout, table layout, absolute layout, frame layout, list view, layout attributes.

### **BCA-E653:Programming using Python Lab**

#### **Course Outcomes (CO)**

- CO1 Understand programming skill in core Python.
- CO2 Demonstrate Python programs and its important features.
- CO3 Implement GUI application using Python.
- CO4 Understand and implement different file handling and database operations.
- CO5 Design and implement text processing, networking and database access in python using various python libraries.