



# UTTARANCHAL UNIVERSITY

(Established vide Uttaranchal University Act, 2012)

(Uttarakhand Act No. 11 of 2013)

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

## Session- 2020-2021

<b>Name of College-</b>	Uttaranchal Institute of Management
<b>Name of Department-</b>	Department of Computer Applications
<b>Program Name-</b>	Bachelor of Computer Application (BCA)
<b>Program Code-</b>	09

## Program Educational Objectives- PEO, Program Specific Outcomes- PSO, Program Outcomes-PO, Course Outcomes-CO

### Program Educational Objectives (PEO)

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

### Program Outcomes-(PO)

<b>PO-1</b>	Understanding of basic Computer Application concepts and principles that aims to prepare young minds for the challenging opportunities in the IT industry
<b>PO-2</b>	Determine, explicate and analyze real time problems using fundamental concepts of Computer Science and relevant domains.
<b>PO-3</b>	Design and develop solutions to meet software requirements in various domains like banking, insurance, healthcare, multimedia and mass communication, etc. using latest technologies.
<b>PO-4</b>	Able to write reports, design documentation and make impressive presentations by learning technical communication skills.
<b>PO-5</b>	Use critical thinking and creativity skills to solve complex problems using modern tools and techniques in ethical way.
<b>PO-6</b>	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.
<b>PO-7</b>	To product employable IT workforce, that will have sound knowledge of IT and business fundamentals
<b>PO-8</b>	Enhance competitive skills, prepare for higher education, and engage in independent and lifelong learning in the broadest context of technological change.



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## Semester- I

**Course Name- Fundamental of Information Technology**

**Course Code (CC)-BCA-C101**

BCA-C101-CO-1	Understand the elementary concepts of computers systems and associated software and hardware components.
BCA-C101-CO-2	Summarize the functioning of associated software system that establishes linkage between internal and external components coupled with the computer systems.
BCA-C101-CO-3	Summarize the basic concepts of digital electronics that acts as the foundation for the logic behind digital computer systems.
BCA-C101-CO-4	Build word documents as per requirement by extensive use of tools available in the application. Apply the knowledge acquired for content creation and construction
BCA-C101-CO-5	Design presentations and analyze data for related activities with respect to particular functional area

## Semester- I

**Course Name- Programming in 'C'**

**Course Code (CC)-BCA-C102**

BCA-C102-CO-1	Understand the basic concepts of C language and develop programming skills
BCA-C102-CO-2	Develop Analytical / Logical Thinking and Problem Solving capabilities.
BCA-C102-CO-3	Design algorithm using concepts of Computer and Information Technology to formulate programs for the real time problems.
BCA-C102-CO-4	Develop sound technical knowledge of programming to enhance employability
BCA-C102-CO-5	Apply the concept of C programming using critical thinking and creativity skills to solve complex problems.



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## Semester- I

Course Name- Technical Communication

Course Code (CC)-BCA-C103

BCA-C103-CO-1	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.
BCA-C103-CO-2	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
BCA-C103-CO-3	Enhance the writing skills, learn the writing process (prewriting/writing/rewriting) and apply them to design and develop appropriate technical and workplace documentation.
BCA-C103--CO-4	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
BCA-C103-CO-5	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.

## Semester- I

Course Name- Mathematical Foundation of Computer Science

Course Code (CC)-BCA-A104

BCA-A104-CO-1	Ability to apply knowledge of mathematics, science, and engineering to solve practical problems
BCA-A104-CO-2	Analyze a problem and identify and define the computing requirements for solution.
BCA-A104-CO-3	Acquire ability to describe computer programs (e.g. recursive functions) in a formal mathematical manner.
BCA-A104-CO-4	Ability to express and analyze logic sentence in terms of predicates, quantifiers, and logical connectives
BCA-A104-CO-5	Apply the technical knowledge to generating the function and recurrence relations to solve the problems



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## Semester- I

**Course Name- PC Packages Lab**

**Course Code (CC)-BCA-C151**

BCA-C151-CO-1	Examine the connection of various hardware components of computer system and its peripherals. Implement and identify the interaction between various hardware and software components.
BCA-C151-CO-2	Apply and implement significant internal and external DOS commands to understand their functionality.
BCA-C151-CO-3	Apply significant concepts of text editing in the application software.
BCA-C151-CO-4	Apply and analyze numerical data pertaining to some mathematical problem to aid in problem solving using application software.
BCA-C151-CO-5	Demonstrate and develop effective presentations using application software.

## Semester- I

**Course Name- Programming in 'C' Lab**

**Course Code (CC)-BCA-C152**

BCA-C152-CO-1	Illustrate C programming development environment, compiling, debugging, linking and executing a program using the development environment
BCA-C152-CO-2	Infer the familiarity with basic Computer Application concepts and formulate algorithm for the real time problems
BCA-C152-CO-3	Apply and practice logical formulations to design and develop solutions to complex problems
BCA-C152-CO-4	Design the required programming components that efficiently solve computing problems in real world
BCA-C152-CO-5	Rephrase the acquired technical communication skills in the form of documentation of the carried out lab work.

## Semester- I

**Course Name- Mini Project I**

**Course Code (CC)-BCA-S153**

BCA-S153-CO-1	Define the problems in various domains that can be solved using computer applications
BCA-S153-CO-2	Develop the ability to identify alternative solutions and plan the project.
BCA-S153-CO-3	Analyze and Design the software development process
BCA-S153-CO-4	To develop coding and testing skills for software development.
BCA-S153-CO-5	Build technical presentation skills and Create project documentation of the complete process.



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## Semester- I

**Course Name- Hygiene and Environmental Health**

**Course Code (CC)-BCA-V105**

<b>BCA-V105-CO-1</b>	Understand the basic principles and concepts of hygiene and environmental health.
<b>BCA-V105-CO-2</b>	Summarize the landmarks of historical development in the field of environmental health, hygiene and sanitation.
<b>BCA-V105-CO-3</b>	Identify the link between environmental health and hygiene.
<b>BCA-V105-CO-4</b>	Assess importance of personal hygiene with respect to public health.
<b>BCA-V105-CO-5</b>	Analyze the contribution of human waste disposal, drinking water supply and water pollution, and solid waste management in affecting human and environmental health.

## Semester- II

**Course Name- Data Structure Using 'C'**

**Course Code (CC)-BCA-C201**

<b>BCA-C201-CO-1</b>	Understand the basic concepts of Data Structures and programming skills.
<b>BCA-C201-CO-2</b>	Determine, explicate and analyze problems using fundamental concepts of Computer Science and develop algorithms to solve the problem.
<b>BCA-C201-CO-3</b>	Illustrate and compare various tools and techniques for algorithms and programming.
<b>BCA-C201-CO-4</b>	Acquire sound knowledge of data structure techniques to enhance the employability status.
<b>BCA-C201-CO-5</b>	Build skills in designing algorithms for various applications to enhance competitive skills and lifelong



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## Semester- II

Course Name- Object Oriented Programming using C++

Course Code (CC)-BCA-C202

BCA-C202-CO-1	Understand the basic concepts of programming and formulate the algorithms and implement the solutions for mathematical problems.
BCA-C202-CO-2	Identify the real-world problem and suggest the solutions to the persist problem by C++ OOPs concepts.
BCA-C202-CO-3	Design and develop the reusable application using inheritance in C++ and apply modern tools to develop applications for various domains using inheritance.
BCA-C202-CO-4	Demonstrate critical thinking to develop robust applications using pointers and polymorphism in C++.
BCA-C202-CO-5	Ability to demonstrate technical skills to solve the IT industry problem with various C++ concepts and enhance the ability to learn new things.

## Semester- II

Course Name- Software Engineering

Course Code (CC)-BCA-C203

BCA-C203-CO-1	Design /Development and compose a software product with the software engineering lifecycle model and demonstrating its competence in planning and developing software and implement the solutions for mathematical problems.
BCA-C203-CO-2	Students are able to analyze and identify the software requirement specification and software matrices. So that efficient software can be developed.
BCA-C203-CO-3	Demonstrate an understanding of and apply current theories, models, and techniques of software engineering to bring out innovative and novelistic solutions for the growth
BCA-C203-CO-4	The potential to develop software engineering capabilities skills to improve technological expertise and employability.
BCA-C203-CO-5	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



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## Semester- II

Course Name- Environmental Science

Course Code (CC)-BCA-A204

BCA-A204-CO-1	Understand the significance of environment & its natural resources, and identify their responsibility as citizens, consumers and environmental actors in complex interconnected environmental systems. software and implement the solutions for mathematical problems.
BCA-A204-CO-2	Demonstrate critical thinking to plan innovative strategies for environmental protection, biodiversity conservation and sustainable development, and facilitate life-long learning
BCA-A204-CO-3	Elaborate the knowledge of the environmental challenges associated with air and noise pollution, solid waste management, and disaster management
BCA-A204-CO-4	Build critical understanding of the major problems associated with water pollution, its sources and impacts on human and ecosystem health
BCA-A204-CO-5	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.

## Semester- II

Course Name- Data Structure Using 'C' Lab

Course Code (CC)-BCA-C251

BCA-C251-CO-1	Infer the familiarity with algorithms and basic concepts of Data Structures and programming skills.
BCA-C251-CO-2	Infer the familiarity with basic concepts of Function, Array and Link-list and formulate algorithm for problems
BCA-C251-CO-3	Apply and practice logical formulations of Stack, Queues, Trees and various Sorting and searching algorithm designs and develop solutions to complex problems
BCA-C251-CO-4	Design new algorithms that efficiently solve computing problems in real world
BCA-C251-CO-5	Rephrase the acquired technical communication skills in the form of documentation of the carried out lab work..



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## Semester- II

Course Name- Programming using C++Lab

Course Code (CC)-BCA-C252

BCA-C252-CO-1	Understand the working of C++ IDE with the fundamentals concepts of programming and implement the solution for mathematical problems.
BCA-C252-CO-2	Develop and implement solutions for various problems using OOPs concepts like Class, objects
BCA-C252-CO-3	Analysis and implement the reusable applications using inheritance.
BCA-C252-CO-4	Learn to create the solutions of complex applications using pointers and polymorphism in C++ programming
BCA-C252-CO-5	Enhance technical knowledge to design console based applications to solve complex mathematical and business problems using file handling, , exception handling and template programming.

## Semester- II

Course Name- Mini Project II

Course Code (CC)-BCA-S253

BCA-S253-CO-1	Define the problems in various domains that can be solved using computer applications.
BCA-S253-CO-2	Develop the ability to identify alternative solutions and plan the project
BCA-S253-CO-3	Analyze and Design the software development process
BCA-S253-CO-4	To develop coding and testing skills for software development.
BCA-S253-CO-5	Build technical presentation skills and Create project documentation of the complete process.

## Semester- II

Course Name- Disaster Management

Course Code (CC)-BCA-V205

BCA-V205-CO-1	Understand basic concepts in disasters, hazards, vulnerability, risk and their management approaches.
BCA-V205-CO-2	Understand approaches of disaster risk reduction, disaster management cycle and phases and the relationship between vulnerability, disasters, disaster prevention and risk reduction
BCA-V205-CO-3	Demonstrate the knowledge about institutional and legal processes, regulations and acts for disaster risk management in India
BCA-V205-CO-4	Inspect some historic disaster case studies from India to find the linkage between disasters and development.
BCA-V205-CO-5	Assess the contribution of international institutions (such as UNISDR, USAD, UNDAC) to provide funds for public health management during a disaster.



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## Semester- III

**Course Name- Database Management Systems**

**Course Code (CC)-BCA-C301**

<b>BCA-C301-CO-1</b>	Understand the vital concepts of database management system and its architecture
<b>BCA-C301-CO-2</b>	Summarize the significance of database management system over traditional file based system
<b>BCA-C301-CO-3</b>	Understand the concept of database normalization and its significance.
<b>BCA-C301-CO-4</b>	Comprehend the transaction processing and recovery concepts
<b>BCA-C301-CO-5</b>	Understand the concept of concurrency control and Serializability in the context of database management system.

## Semester- III

**Course Name- Web Technologies**

**Course Code (CC)- BCA-C302**

<b>BCA-C302-CO-1</b>	Understand the fundamental of web technology, internet protocols and web development tools using web development collaboration and team dynamics
<b>BCA-C302-CO-2</b>	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.
<b>BCA-C302-CO-3</b>	Develop the web designing skills using CSS and learn the programming concept of client side scripting using JavaScript
<b>BCA-C302-CO-4</b>	Implement the server side scripting on the web application using PHP
<b>BCA-C302-CO-5</b>	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.



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## Semester- III

**Course Name- Data Warehouse and Data Mining**

**Course Code (CC)- BCA-C303**

BCA-C303-CO-1	Understand the fundamental concepts, advantages, limitations and significance related to data warehouse.
BCA-C303-CO-2	Understand the models for the data warehouse development and allied components
BCA-C303-CO-3	Understand the concepts of OLAP which later on can be applied in specific problem areas.
BCA-C303-CO-4	Develop critical thinking skills to select a set of feasible techniques for domain specific data mining.
BCA-C303-CO-5	Outline the prominent sub domains of web data mining and text data mining.

## Semester- III

**Course Name- Computer Based Optimization Techniques**

**Course Code (CC)-BCA-C304**

BCA-C304-CO-1	Understand and apply the concept of optimization and classification to solve practical optimization problems
BCA-C304-CO-2	Knowledge of applying evaluation optimization technique in engineering applications.
BCA-C304-CO-3	Apply the technical knowledge and critical thinking to model engineering minima/maxima problems as optimization problems.
BCA-C304-CO-4	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.
BCA-C304-CO-5	Apply the Queuing Models techniques to solve the real worldproblem and also develop the skills to identify the solution of the optimization problem.

## Semester- III

**Course Name- Database Management Systems Lab**

**Course Code (CC)-BCA-C351**

BCA-C351-CO-1	Demonstrate the concepts of creation of tables, views and indexes
BCA-C351-CO-2	Demonstrate the concept of keys and constraints on the tables.
BCA-C351-CO-3	Illustrate the concept of data and structure manipulation
BCA-C351-CO-4	Demonstrate the use of various aggregate functions in SQL on data.
BCA-C351-CO-5	Illustrate the data segregation using various operators in SQL.



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## Semester- III

Course Name- Web Technologies Lab

Course Code (CC)- BCA-C352

BCA-C352-CO-1	Understand the concepts of basic html tags like list tags, table tags, frame tags, form tags to develop the static web pagess
BCA-C352-CO-2	Enhance the view of web pages through web designing techniques using CSS.
BCA-C352-CO-3	Learn the basic concepts of client side scripting and various validations constructs using JavaScript.
BCA-C352-CO-4	Learn the fundamental concepts of server side scripting and basic programming concepts using PHP.
BCA-C352-CO-5	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.

## Semester- III

Course Name- Mini Project III

Course Code (CC)-BCA-S353

BCA-S353-CO-1	Identify the requirement aspects of a project for problem solving.
BCA-S353-CO-2	Able to choose appropriate software engineering process model.
BCA-S353-CO-3	Understand the different project feasibility and requirement and create SRS reports for project.
BCA-S353-CO-4	Choose, Illustrate and apply appropriate software tools and programming languages
BCA-S353-CO-5	Apply software metrics for testing, verification and validation of project

## Semester- IV

Course Name- Operating System and Linux

Course Code (CC) - BCA-C401

BCA-C401-CO-1	Illustrate the fundamentals of operating systems component and demonstrate its functionalities using Linux commands.
BCA-C401-CO-2	Describe the operating system resources and its management techniques.
BCA-C401-CO-3	Compare and illustrate various process scheduling algorithms.
BCA-C401-CO-4	Apply appropriate memory and file management schemes.
BCA-C401-CO-5	Summarize the concepts of Linux operating system and implement Shell programming.



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## Semester- IV

**Course Name- Theory of Computation**

**Course Code (CC) - BCA-C402**

BCA-C402-CO-1	Understand and apply acquired fundamental knowledge of Theory of Computation to formulate various models/machine for solving real time mathematical problems
BCA-C402-CO-2	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 NFA model/machine
BCA-C402-CO-3	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.
BCA-C402-CO-4	Critically analyse the mathematical problem and Design solution to solve it using Turing Machine.
BCA-C402-CO-5	Evaluate the mathematical problem on solvability, decidability, finiteness and provide solution to PCP problems

## Semester- IV

**Course Name- Programming in JAVA**

**Course Code (CC) - BCA-C403**

BCA-C403-CO-1	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
BCA-C403-CO-2	Identify the real-world problem and suggest the solutions to the persistent problem by rapid software development using Java inheritance and packages
BCA-C403-CO-3	Design and develop complex GUI application using Java Applet, AWT, with multithreading mechanism
BCA-C403-CO-4	Develop event-driven GUI applications using various modern Java techniques like Swing, event handling
BCA-C403-CO-5	Apply technical skills to solve the IT industry problems and enhance the employability of the students.



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## Semester- IV

**Course Name- Linux Lab**

**Course Code (CC) - BCA-C451**

BCA-C451-CO-1	Ability to identify the basic Linux general-purpose commands
BCA-C451-CO-2	Apply and change the ownership and file permissions using advanced Linux commands.
BCA-C451-CO-3	Use the pwd, Sed,grep,chmod,sudo etc.
BCA-C451-CO-4	Implement and execute shell scripts.
BCA-C451-CO-5	Analyze and apply various tasks of administrator

## Semester- IV

**Course Name- Programming in JAVA Lab**

**Course Code (CC) - BCA-C452**

BCA-C452-CO-1	Understand the working of Java IDE with the fundamentals concepts of programming to develop basic programs
BCA-C452-CO-2	Develop real world programs using Java packages, interfaces and various OOPs concepts to solve complex problems
BCA-C452-CO-3	Analysis of the critical problems in the real-time environment and able to develop Network supported applications using RMI and multithreading
BCA-C452-CO-4	Implement portable GUI applications with enrich graphics using java Swing to solve real world problems.
BCA-C452-CO-5	Develop technical knowledge to design GUI applications with database support to meet the current industry, academic requirements using JDBC and Swing.



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## Semester- IV

Course Name- Mini Project IV

Course Code (CC) - BCA-S453

BCA-S453-CO-1	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
BCA-S453-CO-2	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.
BCA-S453-CO-3	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.
BCA-S453-CO-4	Produce Entrepreneurs who can analyze the problem and develop customized solution using programming language for small to large enterprises.
BCA-S453-CO-5	Enable the Students to design and develop short research projects in a team using technical knowledge of Software Engineering

## Semester- V

Course Name- Computer Graphics and Animation

Course Code (CC) - BCA-C501

BCA-C501-CO-1	Understand the basic concepts, Algorithm and Disciplinary knowledge of Computer Graphics using OpenGL
BCA-C501-CO-2	Understand the 2D Geometric Primitives and construct the different shapes using OpenGL
BCA-C501-CO-3	Design and implement Algorithms in OpenGL to draw Objects, Clipping, Scan conversion and Filling of basic Objects in 2D Transformations.
BCA-C501-CO-4	Understand and explore the different approaches in Computer Animation
BCA-C501-CO-5	Be capable of using OpenGL to create interactive Computer Graphicstry problems and enhance the employability of the students.



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## Semester- V

**Course Name- Cyber Security**

**Course Code (CC) - BCA-E502**

<b>BCA-E502-CO-1</b>	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.
<b>BCA-E502-CO-2</b>	Able to analyze and determine software security and vulnerabilities solutions to reduce the risk of exploitation.
<b>BCA-E502-CO-3</b>	Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.
<b>BCA-E502-CO-4</b>	Able to design and develop security architecture for an organization.
<b>BCA-E502-CO-5</b>	Able to implement various computer cyber security tools and methods to reduce risk of cyber attacks.

## Semester- V

**Course Name- Digital Marketing**

**Course Code (CC) - BCA-E503**

<b>BCA-E503-CO-1</b>	Understand the fundamental of concepts of digital marketing and impact of implementing and applying digital marketing principles for organization..
<b>BCA-E503-CO-2</b>	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.
<b>BCA-E503-CO-3</b>	Recognize the social media marketing fundamentals, identify the goals, and achieve goals by implementing social digital marketing.
<b>BCA-E503-CO-4</b>	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.
<b>BCA-E503-CO-5</b>	Understand mobile digital marketing techniques like SMS content, developing Mobile responsive websites and apply them to solve marketing problem.



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## Semester- V

**Course Name- Enterprise Resource Planning**

**Course Code (CC) - BCA-E504**

<b>BCA-E504-CO-1</b>	Understand the basic concepts, problem analysis, different Modules and Packages of Enterprise Resource Planning
<b>BCA-E504-CO-2</b>	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.
<b>BCA-E504-CO-3</b>	To understand the OLAP and OLTP operations and develop strategic Business Database
<b>BCA-E504-CO-4</b>	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.
<b>BCA-E504-CO-5</b>	Development and Analysis of ERP Implementations in focusing the various issues through Soft System approaches for present global and Indian market scenario.

## Semester- V

**Course Name- Advance Web Technologies**

**Course Code (CC) - BCA-E505**

<b>BCA-E505-CO-1</b>	To combine web technologies like java script, document object model, to create AJAX application
<b>BCA-E505-CO-2</b>	To apply JSON technology with website to transit and fetch data over the internet.
<b>BCA-E505-CO-3</b>	To develop rich applications with the integration of Web API and Java Script object notation.
<b>BCA-E505-CO-4</b>	To create effective application with the help of session management techniques.
<b>BCA-E505-CO-5</b>	To design web application to manipulate data using PHP and My Sql.



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## Semester- V

**Course Name- Advance JAVA**

**Course Code (CC) - BCA-E506**

<b>BCA-E506-CO-1</b>	Understand the basic concepts of Advance Java for solving the real-life problem in various multidisciplinary setups using Java Servlets
<b>BCA-E506-CO-2</b>	Implement the solutions for the existing problem with rapid Web Application development technique using Java Server Pages
<b>BCA-E506-CO-3</b>	Implement enrich graphic supported application using JavaFx to apply for solving real world problems
<b>BCA-E506-CO-4</b>	Design and develop MVC supported Web applications using java Struts
<b>BCA-E506-CO-5</b>	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.

## Semester- V

**Course Name- Mobile Computing**

**Course Code (CC) - BCA-E507**

<b>BCA-E507-CO-1</b>	Demonstrate and analyze the principles, theories, and importance of mobile computing technologies to enhance employability.
<b>BCA-E507-CO-2</b>	Demonstrate the technology, infrastructures and facilities of mobile computing and able to evaluate the solution to solve mobile computing problem.
<b>BCA-E507-CO-3</b>	Identify the applications in different domains that mobile computing offers to the public, society, and businesses so the employability can enhance.
<b>BCA-E507-CO-4</b>	Demonstrate the possible future aspects of mobile computing technologies and their applications and able to develop the technical skill to handle mobile computing issues.
<b>BCA-E507-CO-5</b>	Compare the different aspects of the routing algorithm and develop the learning skills to face the challenges in mobile computing.



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## Semester- V

**Course Name- Cloud Computing**

**Course Code (CC) - BCA-E508**

<b>BCA-E508-CO-1</b>	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.
<b>BCA-E508-CO-2</b>	Understand and compare the various levels of services that can be achieved by cloud and create flexible and scalable infrastructures.
<b>BCA-E508-CO-3</b>	Analyze and understand the various Cloud Platforms used in Industry and apply them to solve problems in the market on cloud.
<b>BCA-E508-CO-4</b>	Understand and compare the various Scientific, Business and Consumer Applications of Clouds, to select best solution for the existing problem in the Industry
<b>BCA-E508-CO-5</b>	Understanding of when and where to use and providing sufficient foundations to enable

## Semester- V

**Course Name- Computer Graphics and Animation Lab**

**Course Code (CC) - BCA-C551**

<b>BCA-C551-CO-1</b>	Understand the basic concepts, Algorithm and Disciplinary knowledge of Computer Graphics using OpenGL
<b>BCA-C551-CO-2</b>	Understand the 2D Geometric Primitives and construct the different shapes OpenGL.
<b>BCA-C551-CO-3</b>	Design and implement algorithms in OpenGL to draw Objects, Clipping, Scan conversion and Filling of basic Objects in 2D transformations
<b>BCA-C551-CO-4</b>	Learn to create animation application and implement the different approaches in Computer Animation using OpenGL
<b>BCA-C551-CO-5</b>	Be capable of using OpenGL to create and solve interactive Computer Graphics.



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## Semester- V

**Course Name- Advance Web Technologies Lab**

**Course Code (CC) - BCA-E552**

<b>BCA-E552-CO-1</b>	To illustrate GET and POST request processing by using AJAX technology and JQuery.
<b>BCA-E552-CO-2</b>	To solve complex business logics by using Object oriented programming concepts in PHP.
<b>BCA-E552-CO-3</b>	To combine AJAX , DOM and advance javascript to manipulate CSS and DOM contents
<b>BCA-E552-CO-4</b>	To demonstrate use of web API , JSON functionality to create modern web applications.
<b>BCA-E552-CO-5</b>	To solve real world problems by developing interactive web applications using various web technologies and be prepared for IT industry.

## Semester- V

**Course Name- Advance JAVA Lab**

**Course Code (CC) - BCA-E553**

<b>BCA-E553-CO-1</b>	Understand the working of Java IDE with the advance concepts of programming and implement web applications using Servlets
<b>BCA-E553-CO-2</b>	Design and develop web applications using rapid web development technologies like Java Server Pages.
<b>BCA-E553-CO-3</b>	Learn to create console based enrich graphic application and apply them for solving real world problems using JavaFx
<b>BCA-E553-CO-4</b>	Analysis of the critical problems in the real-time environment and able to design Web application using Java struts with validations
<b>BCA-E553-CO-5</b>	Develop technical knowledge to design and implement dynamic web applications to meet the current industry requirements using the Spring Framework



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## Semester- V

Course Name- Mini Project V

Course Code (CC) - BCA-S554

BCA-S554-CO-1	Enhance the presentation skills and student will learn to create proper documentation of the project
BCA-S554-CO-2	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.
BCA-S554-CO-3	Understand the project designing construct using software engineering designing tools like DFD and UML diagrams.
BCA-S554-CO-4	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.
BCA-S554-CO-5	Produce entrepreneurs who can develop customized solution for small to large enterprises.

## Semester- VI

Course Name- Project

Course Code (CC) - BCA-C601

BCA-C601-CO-1	Enhance the presentation skills and student will learn to create proper documentation of the project
BCA-C601-CO-2	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.
BCA-C601-CO-3	Understand the project designing construct using software engineering designing tools like DFD and UML diagrams
BCA-C601-CO-4	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.
BCA-C601-CO-5	Produce entrepreneurs who can develop customized solution for small to large enterprises.



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## Semester- VI

**Course Name- Seminar**

**Course Code (CC) - BCA-C602**

<b>BCA-C602-CO-1</b>	Demonstrate the ability to perform close and critical readings
<b>BCA-C602-CO-2</b>	Understand literature survey, presentation and communication skills
<b>BCA-C602-CO-3</b>	Identify and comprehend main ideas, supporting ideas and details.
<b>BCA-C602-CO-4</b>	Understand and identify the advantages, limitations and applications of specific topic.
<b>BCA-C602-CO-5</b>	Demonstrate an understanding of topic-specific and general academic vocabulary.

## Semester- VI

**Course Name- .NET Framework and Technologies**

**Course Code (CC) - BCA-C603**

<b>BCA-C603-CO-1</b>	Understand the basic concept of programming. To develop problem analysis and problem solving skills for real time problem using .NET framework technology.
<b>BCA-C603-CO-2</b>	Identify and analyze the existing problems in real time environment and develop the new solution using the programming concept using .net framework technology.
<b>BCA-C603-CO-3</b>	Develop critical thinking, analytical skills to develop new window and web application for existing problems using .net framework technology.
<b>BCA-C603-CO-4</b>	Implement validation controls on web based application using ASP.NET validation, standard and rich controls
<b>BCA-C603-CO-5</b>	Develop technical knowledge of ADO.net, Asp.net and window programming so that student can meet the current industry, academic and research requirement.



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## Semester- VI

**Course Name- ANDROID App Development**

**Course Code (CC) - BCA-E604**

<b>BCA-E604-CO-1</b>	Understand basic concept of Object Oriented Programming Concepts & Java Fundamental.
<b>BCA-E604-CO-2</b>	Understand and implement the concept of Android SDK, Android application framework, android runtime, Android lifecycle
<b>BCA-E604-CO-3</b>	Develop android app using Text controls, Images, Button controls, supporting multiple screens.
<b>BCA-E604-CO-4</b>	Develop code in XML and learn the application development life cycle.
<b>BCA-E604-CO-5</b>	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.

## Semester- VI

**Course Name- Programming using Python**

**Course Code (CC) - BCA-E605**

<b>BCA-E605-CO-1</b>	To enhance the ability to solve problems using system approaches, critical and innovative thinking, and technology to create solutions
<b>BCA-E605-CO-2</b>	Understand the purpose and the process of code in python.
<b>BCA-E605-CO-3</b>	Understand the object oriented paradigm in python program
<b>BCA-E605-CO-4</b>	Acquire project skills in core python.
<b>BCA-E605-CO-5</b>	Design and analyze text processing, networking and implement database access in python using various python libraries.

## Semester- VI

**Course Name- .NET Framework and Technologies Lab**

**Course Code (CC) - BCA-C651**

<b>BCA-C651-CO-1</b>	Understand the working of visual studio IDE with the fundamentals concepts of programming using C# .NET.
<b>BCA-C651-CO-2</b>	Understand the fundamentals of Object oriented programming and apply to create console application using C#.net.
<b>BCA-C651-CO-3</b>	Analysis the critical problems of the real time environment and able to design new windows application using windows programming constructs through c#.net.
<b>BCA-C651-CO-4</b>	Learn to create web application and implement validation controls on web-based application using ASP.NET validation, standard and rich controls.
<b>BCA-C651-CO-5</b>	Develop technical knowledge of ADO.net, Asp.net and window programming so that student can meet the current industry, academic and research requirement.



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## Semester- VI

**Course Name- ANDROID App Development Lab**

**Course Code (CC) - BCA-E652**

<b>BCA-E652-CO-1</b>	Understand the object oriented programming concept and apply to develop android application using exception handling
<b>BCA-E652-CO-2</b>	Understand the Android development environment, Android SDK, Android application framework, android runtime, Android lifecycle to develop the android mobile application.
<b>BCA-E652-CO-3</b>	Develop android application using Text controls, Images, Button controls, supporting multiple screens
<b>BCA-E652-CO-4</b>	Understand the concept of broad casting and develop and android application creating and registering the broadcasting receiver.
<b>BCA-E652-CO-5</b>	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.

## Semester- VI

**Course Name- Programming using Python Lab**

**Course Code (CC) - BCA-E653**

<b>BCA-E653-CO-1</b>	Understand programming skill in core Python.
<b>BCA-E653-CO-2</b>	Demonstrate Python programs and its important features.
<b>BCA-E653-CO-3</b>	Implement GUI application using Python.
<b>BCA-E653-CO-4</b>	Understand and implement different file handling and database operations
<b>BCA-E653-CO-5</b>	Design and implement text processing, networking and database access in python using various python libraries.