



UTTARANCHAL UNIVERSITY

(Established vide Uttaranchal University Act, 2012)

(Uttarakhand Act No. 11 of 2013)

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

Session: 2021-2022

Name of College:	Uttaranchal Institute of Management
Name of Department:	Department of Computer Applications
Program Name:	Bachelor of Science (Information Technology)
Program Code:	10

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

Program Educational Objectives (PEO)

PEO-1	Graduates are prepared to be employed in IT industries by providing expected domain knowledge
PEO-2	Graduates are provided with practical training, hands-on and project experience to meet the industrial needs.
PEO-3	Graduates are motivated in career and entrepreneurial skill development to become global leaders.
PEO-4	Graduates are trained to demonstrate creativity, develop innovative ideas and to work in teams to accomplish a common goal.
PEO-5	Graduates are addressed with social issues and guided to operate problems with solutions.

Program Outcomes-(PO)

PO-1	Apply the knowledge of computer and information technology concepts and principles in different domains.
PO-2	Identify, formulate and analyze complex computing problems using fundamental concepts of computer science and related areas
PO-3	Design and develop IT solutions for problems that meet the specified needs with appropriate consideration for public health, safety, cultural, societal and environmental considerations.
PO-4	Use critical thinking and creativity skills to solve complex problems using modern tools and techniques in ethical way
PO-5	Work efficaciously as a team member or a leader to accomplish a common goal in a multi-disciplinary team.
PO-6	Communicate effectively by imparting or exchanging of technical information by speaking, writing, or using some other medium, being able to produce technical reports and design documentation and make effective presentations.



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PO-7	Attain project-based learning skills, whereby being able to define the problem, identify best solutions, plan the project, execute the plan, monitor and control the project progress and finally complete the project.
PO-8	Strengthen the independent and life-long learning for continued professional development as an employee at multiple levels or an entrepreneur.

Program Specific Outcomes (PSO)

PSO-1	Professionally trained in the areas of programming, security, web designing, and networking and to acquire knowledge in various domain based electives.
PSO-2	Abet students to communicate effectively and to improve their competency skills to solve real time problems
PSO-3	The ability to employ modern computer languages and applications for their successful career, to create platforms to become an entrepreneur and a relish for higher studies.
PSO-4	Explore technical knowledge in diverse areas of IT and experience an environment conducive in cultivating skills for successful career, entrepreneurship and higher studies



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Semester- I

Course Name: Fundamentals of Computer and Information Technology

Course Code (CC): BSIT-C101

BSIT-C101-CO-1	Understand the fundamental concepts of computers systems and associated software and hardware components
BSIT-C101-CO-2	Outline the working of associated software system that establishes linkage between internal and external components coupled with the computer systems.
BSIT-C101-CO-3	Design presentations; analyze data, content documentation for related activities with respect to particular functional area.
BSIT-C101-CO-4	Understand the fundamental concepts of programming languages act as base to programming environment.
BSIT-C101-CO-5	Outline the basic concepts of computer network and allied technologies and techniques. Identify concepts of network threats and preventive techniques.

Semester- I

Course Name: Programming in C

Course Code (CC): BSIT-C102

BSIT-C102-CO-1	Understand the basic concepts of C language and develop programming skills.
BSIT-C102-CO-2	Develop Analytical / Logical Thinking and Problem Solving capabilities.
BSIT-C102-CO-3	Design algorithm using concepts of Computer and Information Technology to formulate programs for the real time problems
BSIT-C102-CO-4	Develop sound technical knowledge of programming to enhance employability
BSIT-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: Mathematical Foundation of Computer Science

Course Code (CC): BSIT-G103(GE1)

BSIT-G103(GE1)-CO-1	Ability to apply knowledge of mathematics, science, and engineering to solve practical problems.
BSIT-G103(GE1)-CO-2	Analyze a problem and identify and define the computing requirements for solution.
BSIT-G103(GE1)-CO-3	Acquire ability to describe computer programs (e.g. recursive functions) in a formal mathematical manner
BSIT-G103(GE1)-CO-4	Ability to express and analyze logic sentence in terms of predicates, quantifiers, and logical connectives.
BSIT-G103(GE1)-CO-5	Apply the technical knowledge to generating the function and recurrence relations to solve the problems

Semester- I

Course Name: Probability & Statistical Technique

Course Code (CC): BSIT-G103(GE2)

BSIT-G103(GE2)-CO-1	Describe and discuss the key terminology, concepts and techniques used in statistical analysis.
BSIT-G103(GE2)-CO-2	Understand and critically discuss the issues surrounding sampling and significance.
BSIT-G103(GE2)-CO-3	Conduct basic statistical analysis of data using correlation, regression and chi-square test.
BSIT-G103(GE2)-CO-4	Able to apply and understand several well-known distributions, including binomial, hyper geometric, chebyshev, Poisson, geometric and Erlang distribution.
BSIT-G103(GE2)-CO-5	Able to understand the basic knowledge on fundamental probability concepts, including random variable, probability of an event, additive rules, conditional probability, Baye's theorem, and mathematical expectation.



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Semester- I

Course Name: Technical Communication

Course Code (CC): BSIT-A104

BSIT-A104-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.

BSIT-A104-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

BSIT-A104-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.

BSIT-A104-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

BSIT-A104-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: PC Packages Lab

Course Code (CC): BSIT-C151

BSIT-C151-CO-1

Identify the interconnection of various hardware components of computer system and its peripherals. Experiment and establish the interaction between various hardware and software components.

BSIT-C151-CO-2

Implement significant internal and external DOS commands to understand their functionality.

BSIT-C151-CO-3

Implement and apply significant concepts of text editing in the application software.

BSIT-C151-CO-4

Apply and analyze numerical data pertaining to some mathematical problem to aid in problem solving using application software

BSIT-C151-CO-5

Develop and Apply the effective presentation using application Software



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Semester- I

Course Name: Programming in 'C' Lab

Course Code (CC): BSIT-C152

BSIT-C152-CO-1

Illustrate C programming development environment, compiling, debugging, linking and executing a program using the development environment.

BSIT-C152-CO-2

Infer the familiarity with basic Computer Application concepts and formulate algorithm for the real time problems

BSIT-C152-CO-3

Apply and practice logical formulations to design and develop solutions to complex problems.

BSIT-C152-CO-4

Design the required programming components that efficiently solve computing problems in real world.

BSIT-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): BSIT-S153

BSIT-S153-CO-1

Define the problems in various domains that can be solved using computer applications.

BSIT-S153-CO-2

Develop the ability to identify alternative solutions and plan the project.

BSIT-S153-CO-3

Analyze and Design the software development process.

BSIT-S153-CO-4

To develop coding and testing skills for software development.

BSIT-S153-CO-5

Build technical presentation skill and create project documentation of complete process.



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Semester- II

Course Name: Data Structure Using 'C'

Course Code (CC): BSIT-C201

BSIT-C201-CO-1

Understand the basic concepts of Data Structures and programming skills.

BSIT-C201-CO-2

Determine, explicate and analyze problems using fundamental concepts of Computer Science and develop algorithms to solve the problem.

BSIT-C201-CO-3

Illustrate and compare various tools and techniques for algorithms and programming.

BSIT-C201-CO-4

Acquire sound knowledge of data structure techniques to enhance the employability status.

BSIT-C201-CO-5

Build skills in designing algorithms for various applications to enhance competitive skills and lifelong learning in the broadest context of technological change.

Semester- II

Course Name: Object Oriented Programming Using C++

Course Code (CC): BSIT-C202

BSIT-C202-CO-1

Understand the basic concepts of programming and formulate the algorithms and implement the solutions for mathematical problems.

BSIT-C202-CO-2

Identify the real-world problem and suggest the solutions to the persistent problem by C++ OOPs concept.

BSIT-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.

BSIT-C202-CO-4

Demonstrate critical thinking to develop robust applications using pointers and polymorphism in C++.

BSIT-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.



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Semester- II

Course Name: Environmental Science

Course Code (CC): BSIT-A203

BSIT-A203-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.
BSIT-A203-CO-2	Demonstrate critical thinking to plan innovative strategies for environmental protection, biodiversity conservation and sustainable development, and facilitate life- long learning.
BSIT-A203-CO-3	Elaborate the knowledge of the environmental challenges associated with air and noise pollution, solid waste management, and disaster management.
BSIT-A203-CO-4	Build critical understanding of the major problems associated with water pollution, its sources and impacts on human and ecosystem health.
BSIT-A203-CO-5	Reflect critically about the consequences of human action on the environment, its subsequent impact on human health & welfare and take part in finding their solution by appraising the latest environmental policies.

Semester- II

Course Name: Organizational Structure and Personnel Management

Course Code (CC): BSIT-G204(GE1)

BSIT-G204(GE1)-CO-1	Acquire in-depth knowledge of the basic principles of management and organization structure and depict its influence on the current practice and real time challenges faced.
BSIT-G204(GE1)-CO-2	Identify & analyze the significance of the organization behavior and personnel management, formulate key skills required to create a value based and ethically sound system for organization.
BSIT-G204(GE1)-CO-3	Analyze and apply the concept of management practices, organizing & formulate the authority allocation to support effective managerial decision-making and communication and create and develop managerial and organizational solutions using case studies.
BSIT-G204(GE1)-CO-4	Design and Develop technically sound workforce, job analysis process, performance appraisal techniques and relevant training systems using latest tools and techniques.
BSIT-G204(GE1)-CO-5	Critically think and suggest the structural recommendations or design software for various domains after acquiring the conceptual knowledge of Management Procedures, Organizational Structure, and Human Resource Management related Practices.



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Semester- II

Course Name: Management Information System	
Course Code (CC): BSIT-G204(GE2)	
BSIT- G204(GE2)-CO-1	Apply the basic concepts and technologies of management information systems used in the field of business/ management.
BSIT- G204(GE2)-CO-2	Analyze, design, develop, implement and maintain, reliable, cost-efficient, user- friendly information systems that firmly support managerial, operational and strategic framework of an organization.
BSIT- G204(GE2)-CO-3	Critically think and find solutions for of the ethical, social, and security issues of information systems.
BSIT- G204(GE2)-CO-4	Understand the management process like human resource, financial management, supply chain management and strategic management, realizing their requirement and accordingly design the IT infrastructure to solve the business problems.
BSIT- G204(GE2)-CO-5	Attain skills to evaluate the existing business processes, identify the issues and utilize the opportunities for re-engineering, which would build platform for lifelong learning and continued professional development

Semester- II

Course Name: Data Structure using 'C' Lab	
Course Code (CC): BSIT- C251	
BSIT-C251-CO-1	Infer the familiarity with algorithms and basic concepts of Data Structures and programming skills.
BSIT-C251-CO-2	Infer the familiarity with basic concepts of Function, Array and Link-list and formulate algorithm for problems
BSIT-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.
BSIT-C251-CO-4	Design new algorithms that efficiently solve computing problems in real world.
BSIT-C251-CO-5	Rephrase the acquired technical communication skill 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): BSIT- C252

BSIT-C252-CO-1	Understand the working of C++ IDE with the fundamentals concepts of programming using C++ data types, keywords and operators
BSIT-C252-CO-2	Develop the fundamentals of Object-oriented programming to create a console application using C++ programming techniques like class and object.
BSIT-C252-CO-3	Analysis of the critical problems of the real-time environment and able to design reusable applications using inheritance.
BSIT-C252-CO-4	Learn to create complex applications using pointers and polymorphism in C++ programming
BSIT-C252-CO-5	Enhance technical knowledge to design Console based applications to solve Complex mathematical and business problems using file handling, and template programming in C++.

Semester- II

Course Name: Mini Project II

Course Code (CC): BSIT- S253

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

Semester- III

Course Name: Database Management System

Course Code (CC): BSIT-C301

BSIT-C301-CO-1	Understand and analyze the fundamental concepts of DBMS.
BSIT-C301-CO-2	Able to write structured query language in formal and practical way.
BSIT-C301-CO-3	Simplify the relational model and design database application.
BSIT-C301-CO-4	Analyze the concept of the logical design of databases, including the E-R method and normalization approach.
BSIT-C301-CO-5	Analyze and select storage and recovery techniques of database system.



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Semester- III

Course Name: Web Technologies and PHP

Course Code (CC): BSIT-C302

BSIT-C302-CO-1

Understand the fundamental of web technology, internet protocols and web development tools using web development collaboration and team dynamics.

BSIT-C302-CO-2

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.

BSIT-C302-CO-3

Develop the web designing skills using CSS and learn the programming concept of client-side scripting using JavaScript.

BSIT-C302-CO-4

Implement the server-side scripting on the web application using PHP.

BSIT-C302-CO-5

Develop technical knowledge of database connectivity and validation of web application through My SQL, PHP and JavaScript so that student can meet the current industry, academic and research requirement

Semester- III

Course Name: Digital Electronics and Computer Organization

Course Code (CC): BSIT-C303

BSIT-C303-CO-1

Define the theory of Digital Design and Computer Organization to provide an insight of how basic computer components are specified.

BSIT-C303-CO-2

Explore the structure of various number systems and its application in digital design.

BSIT-C303-CO-3

Understand and analyze various combinational circuits.

BSIT-C303-CO-4

Analyzing, Applying and Evaluating issues related to ISA, memory, control and I/O functions.

BSIT-C303-CO-5

Summarizing the CISC and RISC machine architecture.



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Semester- III

Course Name: Computer Based Optimization Techniques

Course Code (CC): BSIT-G304(GE1)

BSIT-G304(GE1)-CO-1	Understand and apply the concept of optimization and classification to solve practical Optimization problems.
BSIT-G304(GE1)-CO-2	Knowledge of formulate and solve transportation, traveling salesman and transshipment problems.
BSIT-G304(GE1)-CO-3	Apply the technical knowledge to select optimal problems solving techniques for a give problem using different LPP methods
BSIT-G304(GE1)-CO-4	Apply the technical and critical thinking to solve different problems of sequencing and assignment
BSIT-G304(GE1)-CO-5	Apply the Game theory model to solve the real world problem.

Semester- III

Course Name: Computer Based Numerical Techniques

Course Code (CC): BSIT-G304(GE2)

BSIT- G304(GE2)-CO-1	Understand fundamental of numerical computation and it's applicability.
BSIT- G304(GE2)-CO-2	Understand concepts of numerical methods to analyze and solve mathematical problems by formulating simple algorithm.
BSIT- G304(GE2)-CO-3	Compute the error estimation of the algorithms designed for numerical methods to solve mathematical problems
BSIT- G304(GE2)-CO-4	Apply numerical methods to find solutions of linear equation problems.
BSIT- G304(GE2)-CO-5	Apply knowledge of computing, mathematics, science, and engineering appropriate to find solutions to differential equations

Semester- III

Course Name: Database Management System Lab

Course Code (CC): BSIT-C351

BSIT-C351-CO-1	Implement a query in database using SQL DML/DDL commands
BSIT-C351-CO-2	Design and implement a database schema for a given problem domain
BSIT-C351-CO-3	Declare and enforce integrity constraints on a database using RDBMS concept
BSIT-C351-CO-4	Can connect the GUI application with the database
BSIT-C351-CO-5	Analyze and Select storage and recovery techniques of database system.



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Semester- III

Course Name: Web Technologies and PHP Lab

Course Code (CC): BSIT-C352

BSIT-C352-CO-1	Understand the concepts of basic html tags like list tags, table tags, frame tags, form tags to develop the static web pages
BSIT-C352-CO-2	Enhance the view of web pages through web designing techniques using CSS.
BSIT-C352-CO-3	Learn the basic concepts of client side scripting and various validations constructs using JavaScript.
BSIT-C352-CO-4	Learn the fundamental concepts of server side scripting and basic programming concepts using PHP
BSIT-C352-CO-5	Develop technical knowledge of database connectivity and validation of web application through My SQL, 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): BSIT-S353

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

Semester- IV

Course Name: Operating System and Linux

Course Code (CC): BSIT-C401

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



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Semester- IV

Course Name: Programming in JAVA

Course Code (CC): BSIT-C402

BSIT-C402-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
BSIT-C402-CO-2	Identify the real-world problem and suggest the solutions to the persistent problem by rapid software development using java inheritance.
BSIT-C402-CO-3	Design and develop complex GUI application using Java Applet, AWT, with multithreading mechanism.
BSIT-C402-CO-4	Develop event-driven GUI applications using various modern Java techniques like Swing, event handling.
BSIT-C402-CO-5	Apply technical skills to solve the IT industry problem and enhance the employability of the student.

Semester- IV

Course Name: Software Engineering

Course Code (CC): BSIT-C403

BSIT-C403-CO-1	Understand the problem in existing System by using different techniques of Software Engineering and plan the project, execute the plan, monitor and control the project progress and finally complete the project.
BSIT-C403-CO-2	Identify, formulate, and solve Software Engineering problems, including the Specification, Design and Implementation of Software Systems that meet Performance, Maintenance and Quality requirements.
BSIT-C403-CO-3	Be able to Compare various Testing Techniques and relate Software advancement methods to build Quality Software Products
BSIT-C403-CO-4	Be able to develop high-quality software at low cost and with a small cycle of time those meets the Organization need and evaluate the impact of their solutions in a global and societal context.
BSIT-C403-CO-5	Evaluate project management strategies for effective software development.



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Semester- IV

Course Name: Graph Theory

Course Code (CC): BSIT-G404(GE1)

BSIT-G404(GE1)-CO-1	Formulate problems in terms of graphs.
BSIT-G404(GE1)-CO-2	Solve graph theoretic problem.
BSIT-G404(GE1)-CO-3	Apply algorithms to solve complex problems.
BSIT-G404(GE1)-CO-4	Use generating functions to solve a variety of combinatorial problems
BSIT-G404(GE1)-CO-5	Implement the numerical methods using computer software and apply them in example.

Semester- IV

Course Name: Discrete Mathematics

Course Code (CC): BSIT-G404(GE2)

BSIT- G404(GE2)-CO-1	Demonstrate and analyze the set theory to solve the complex problem by using different types of relations methods such as composite relations, equality relation
BSIT- G404(GE2)-CO-2	Apply and analyze the groups and their properties to understand the complex mathematical problems.
BSIT- G404(GE2)-CO-3	Be skilled in formally explaining mathematical properties through the formal language of the propositional logic and predicate logic. Also apply and analyze the computational problems.
BSIT- G404(GE2)-CO-4	Apply and analyze the graph theory and different types of recursive relations using to solve the mathematical problems.
BSIT- G404(GE2)-CO-5	Apply and analyze the grouping problem by using permutations and combinations concept. To understand the computational problems discrete probability concept is used.

Semester- IV

Course Name: Linux Lab

Course Code (CC): BSIT-C451

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



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Semester- IV

Course Name: Programming in JAVA Lab

Course Code (CC): BSIT-C452

BSIT-C452-CO-1	Understand the working of Java IDE with the fundamentals concepts of programming Using Net beans, and develop small programs.
BSIT-C452-CO-2	Develop the fundamentals of Object-oriented programming to create a console application using Java programming.
BSIT-C452-CO-3	Analysis of the critical problems of the real-time environment and able to design Network based application using RMI.
BSIT-C452-CO-4	Learn to create portable GUI applications with enrich graphics using Java AWT and Swing
BSIT-C452-CO-5	Develop technical knowledge to design GUI applications with database support to meet the current industry, academic requirements using JDBC and Swing.

Semester- IV

Course Name: Mini Project IV

Course Code (CC): BSIT-S453

BSIT-S453-CO-1	Define the problems in various domains that can be solved using computer applications.
BSIT-S453-CO-2	Develop the ability to identify alternative solutions and plan the project.
BSIT-S453-CO-3	Analyze and Design the software development process.
BSIT-S453-CO-4	To develop coding and testing skills for software development
BSIT-S453-CO-5	Build technical presentation skills and Create project documentation of the complete process.

Semester- V

Course Name: Data Communication and Networks

Course Code (CC): BSIT-C501

BSIT-C501-CO-1	Understand and apply acquired fundamental knowledge of digital data communication techniques and its standards
BSIT-C501-CO-2	Determine, explicate and analyze problems using fundamental concepts of Computer Networks and suggest new ways to solve the problem.
BSIT-C501-CO-3	Inspect the various concepts of network topologies, components and categories of networks to enhance the employability status.
BSIT-C501-CO-4	Make use of the concepts of OSI layers, functions and its protocols to examine challenges in Computer Networks.
BSIT-C501-CO-5	Build skills in Computer Networks to enhance competitive skills and lifelong learning in the broadest context of technological change.



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Semester- V

Course Name: .Net Framework and Technology

Course Code (CC): BSIT-C502

BSIT-C502-CO-1	Understand the basic concept of programming. To develop problem analysis and problem solving skills for real time problem using .NET framework technology
BSIT-C502-CO-2	Identify and analyze the existing problems in real time environment and develop the new solution using the programming concept using .net framework technology.
BSIT-C502-CO-3	Develop critical thinking, analytical skills to develop new window and web application for existing problems using .net framework technology.
BSIT-C502-CO-4	Implement validation controls on web based application using ASP.NET validation, standard and rich controls.
BSIT-C502-CO-5	Develop technical knowledge of ADO.net, Asp.net and window programming so that student can meet the current industry, academic and research requirement.

Semester- V

Course Name: Theory of Computation

Course Code (CC): BSIT-C503

BSIT-C503-CO-1	Understand and apply acquired fundamental knowledge of Theory of Computation to formulate various models/machine for solving real time mathematical problems
BSIT-C503-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 NDFA model/machine
BSIT-C503-CO-3	Classify and critically evaluate various types of ambiguous and non-ambiguous grammar and thus analyze, formulate the syntax of various programming languages through designing solutions using Push Down Automata
BSIT-C503-CO-4	Critically analyze the mathematical problem and Design solution to solve it using Turing Machine.
BSIT-C503-CO-5	Evaluate the mathematical problem on solvability, decidability, finiteness and provide solution to PCP problems.



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Semester- V

Course Name: Computer Graphics and Animation

Course Code (CC): BSIT-E504(DE1)

BSIT-E504(DE1)-CO-1

Understand the basic concepts, Algorithm and Disciplinary knowledge of Computer Graphics using C language and Adobe Photoshop

BSIT-E504(DE1)-CO-2

Design and implement algorithms to draw objects and convert the basic geometrical primitives in 2D transformations using C Language.

BSIT-E504(DE1)-CO-3

Learn to create Animation Application and implement the different approaches in Computer Animation using C Language.

BSIT-E504(DE1)-CO-4

Develop skill to apply mathematical concept and Graphics Programming techniques to design and create Computer Graphics Application using C Language

BSIT-E504(DE1)-CO-5

Understand Photoshop Environment and by using it to develop effective graphics for both Web and Print Media

Semester- V

Course Name: Design and Analysis of Algorithm

Course Code (CC): BSIT-E504(DE2)

BSIT- E504(DE2)-CO-1

Ability to analyze the performance of algorithms.

BSIT- E504(DE2)-CO-2

Ability to choose appropriate algorithm design techniques for solving problems.

BSIT- E504(DE2)-CO-3

Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm.

BSIT- E504(DE2)-CO-4

Describe and analyze various sorting algorithms like bubble, selection, insertion, merge sort, heap sort and quick sort and therefore develop technical and logical skills.

BSIT- E504(DE2)-CO-5

Able to understand major graph algorithms, their analyses and able to employ graphs to model engineering problems, when appropriate



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Semester- V

Course Name: .Net Framework and Technology Lab

Course Code (CC): BSIT-C551

BSIT-C551-CO-1	Understand the working of visual studio IDE with the fundamentals concepts of programming using C# .NET.
BSIT-C551-CO-2	Develop the fundamentals of Object oriented programming to create console application using C#.net.
BSIT-C551-CO-3	Analysis the critical problems of the real time environment and able to design new windows application using windows programming constructs through c#.net.
BSIT-C551-CO-4	Learn to create web application and implement validation controls on web-based application using ASP.NET validation, standard and rich controls.
BSIT-C551-CO-5	Develop technical knowledge of ADO.net, Asp.net and window programming so that student can meet the current industry, academic and research requirement

Semester- V

Course Name: Computer Graphics and Animation Lab

Course Code (CC): BSIT-E552(DE1)

BSIT-E552(DE1)-CO-1	Understand the basic concepts, Algorithm and Disciplinary knowledge of Computer Graphics using C language and Adobe Photoshop
BSIT-E552(DE1)-CO-2	Design and implement algorithms to draw objects and convert the basic geometrical primitives in 2D transformations using C Language
BSIT-E552(DE1)-CO-3	Learn to create Animation Application and implement the different approaches in Computer Animation using C Language.
BSIT-E552(DE1)-CO-4	Develop skill to apply mathematical concept and Graphics Programming techniques to design and create Computer Graphics Application using C Language
BSIT-E552(DE1)-CO-5	Understand Photoshop Environment and by using it to develop effective graphics for both Web and Print Media.



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Semester- V

Course Name: Design and Analysis of Algorithms Lab

Course Code (CC): BSIT-E552(DE2)

BSIT-E552(DE2)-CO-1	Able to implement programs to solve problems using algorithm design techniques such as Divide and Conquer.
BSIT-E552(DE2)-CO-2	Analyze and compare the performance of algorithms using language features.
BSIT-E552(DE2)-CO-3	Able to implement Quick sort, Merge sort algorithm, and other sorting algorithms.
BSIT-E552(DE2)-CO-4	Apply and implement learned algorithm design techniques and data structures to solve real world problems
BSIT-E552(DE2)-CO-5	Able to implement different graph algorithms and their analyses.

Semester- V

Course Name: Mini Project V

Course Code (CC): BSIT-S553

BSIT-S553-CO-1	Enhance the presentation skills and student will learn to create proper documentation of the project
BSIT-S553-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.
BSIT-S553-CO-3	Understand the project designing construct using software engineering designing tools like DFD and UML diagrams.
BSIT-S553-CO-4	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.
BSIT-S553-CO-5	Produce entrepreneurs who can develop customized solution for small to large enterprises.



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Semester- VI

Course Name: Project

Course Code (CC): BSIT-C601

BSIT-C601-CO-1	Enhance the presentation skills and student will learn to create proper documentation of the project
BSIT-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.
BSIT-C601-CO-3	Understand the project designing construct using software engineering designing tools like DFD and UML diagrams.
BSIT-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 texting, alpha testing and beta testing techniques on the project.
BSIT-C601-CO-5	Produce entrepreneurs who can develop customized solution for small to large enterprises.

Semester- VI

Course Name: Seminar

Course Code (CC): BSIT-C602

BSIT-C602-CO-1	Identify and comprehend main ideas, supporting ideas, and details.
BSIT-C602-CO-2	Demonstrate the ability to perform close and critical readings.
BSIT-C602-CO-3	Develop and respond to meaningful discussion questions based on technical texts
BSIT-C602-CO-4	Demonstrate an understanding of topic-specific and general academic vocabulary.
BSIT-C602-CO-5	Use new, topic-related vocabulary successfully in communication activities and discussions.

Semester- VI

Course Name: Android App Development

Course Code (CC): BSIT-E603(DE1)

BSIT-E603(DE1)-CO-1	Understand basic concept of Object Oriented Programming Concepts & Java Fundamental
BSIT-E603(DE1)-CO-2	Understand and implement the concept of Android SDK, Android application framework, android runtime, Android lifecycle
BSIT-E603(DE1)-CO-3	Develop android app using Text controls, Images, Button controls, supporting multiple screens.
BSIT-E603(DE1)-CO-4	Develop code in XML and learn the application development life cycle.
BSIT-E603(DE1)-CO-5	Enhance the development skills of student to create mobile application using UI layouts: pre-defined android layouts,



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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): BSIT-E603(DE2)

BSIT- E603(DE2)-CO-1	Enhance the ability to solve problems using system approaches, critical and innovative thinking, and technology to create solutions.
BSIT- E603(DE2)-CO-2	Understand the purpose and the process of code in python.
BSIT- E603(DE2)-CO-3	Understand the object oriented paradigm in python program.
BSIT- E603(DE2)-CO-4	Acquire project skills in core python.
BSIT- E603(DE2)-CO-5	Design and analyze GUI interfaces and implement database access in python using various python libraries.

Semester- VI

Course Name: Advance PHP

Course Code (CC): BSIT-E604(DE1)

BSIT- E604(DE1)-CO-1	Create PHP scripts that use object-oriented PHP.
BSIT- E604(DE1)-CO-2	Implement business logic within the database.
BSIT- E604(DE1)-CO-3	Test and debug object-oriented PHP scripts
BSIT- E604(DE1)-CO-4	To develop rich interactive web applications with the integration of Web API and Java Script object notation.
BSIT- E604(DE1)-CO-5	Enhance the development skills of student to create websites and web applications of vendors which leads to more employment opportunities to students

Semester- VI

Course Name: Advance JAVA

Course Code (CC): BSIT-E604(DE2)

BSIT- E604(DE2)-CO-1	Understand the basic concepts of Advance Java for solving the real-life problem in various multidisciplinary setups using Java Servlets
BSIT- E604(DE2)-CO-2	Implement the solutions for the existing problem with rapid software development using Java Server Pages
BSIT- E604(DE2)-CO-3	Design and develop MVC supported Web applications using java Struts.
BSIT- E604(DE2)-CO-4	Implement database applications using Hibernate Framework.
BSIT- E604(DE2)-CO-5	Design and Develop scalable, secure Web-based applications as per the current industry requirement and enhance the employability of the students with frameworks.



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Semester- VI

Course Name: Cyber Security

Course Code (CC): BSIT-E605(DE1)

BSIT- E605(DE1)-CO-1

Understand the fundamental concept of cyber security like cyber threats, challenges in internet governance, categories of cybercrimes and able to analyze the cyber-attack through cyber security tools.

BSIT- E605(DE1)-CO-2

Able to analyze and determine software security and vulnerabilities solutions to reduce the risk of exploitation

BSIT- E605(DE1)-CO-3

Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools

BSIT- E605(DE1)-CO-4

Able to design and develop security architecture for an organization

BSIT- E605(DE1)-CO-5

Able to implement various computer cyber security tools and methods to reduce risk of cyber-attacks

Semester- VI

Course Name: Data Warehouse and Data Mining

Course Code (CC): BSIT-E605(DE2)

BSIT- E605(DE2)-CO-1

Understand the elementary concepts, pros & cons and implications related to data warehouse.

BSIT- E605(DE2)-CO-2

Understand the working of different data warehouse models and allied components.

BSIT- E605(DE2)-CO-3

Understand the concepts of OLAP, ROLAP, MOLAP and HOLAP which acts as foundation towards data warehouse development.

BSIT- E605(DE2)-CO-4

Develop critical thinking skills to select a set of feasible techniques for domain specific data mining.

BSIT- E605(DE2)-CO-5

Summarize the prominent sub domains of web data mining and text data mining.



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Semester- VI

Course Name: Enterprise Resource Planning

Course Code (CC): BSIT-E605(DE3)

BSIT- E605(DE3)-CO-1	Understand the basic concepts, problem analysis, different Modules and Packages of Enterprise Resource Planning.
BSIT- E605(DE3)-CO-2	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.
BSIT- E605(DE3)-CO-3	To understand the OLAP and OLTP operations and develop strategic Business Database.
BSIT- E605(DE3)-CO-4	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.
BSIT- E605(DE3)-CO-5	Development and Analysis of ERP Implementations in focusing the various issues through Soft System approaches for present global and Indian market scenario.

Semester- VI

Course Name: Android App Development Lab

Course Code (CC): BSIT-E651(DE1)

BSIT-E651(DE1)-CO-1	Understand the object oriented programming concept and apply to develop android application using exception handling
BSIT-E651(DE1)-CO-2	Understand the Android development environment, Android SDK, Android application framework, android runtime, Android lifecycle to develop the android mobile application.
BSIT-E651(DE1)-CO-3	Develop android application using Text controls, Images, Button controls, supporting multiple screens.
BSIT-E651(DE1)-CO-4	Understand the concept of broad casting and develop and android application creating and registering the broadcasting receiver.
BSIT-E651(DE1)-CO-5	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.



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Semester- VI

Course Name: Programming using Python Lab

Course Code (CC): BSIT-E651(DE2)

BSIT- E651(DE2)-CO-1	Understand programming skill in core Python.
BSIT- E651(DE2)-CO-2	Demonstrate Python programs and its important features.
BSIT- E651(DE2)-CO-3	Implement GUI application using Python.
BSIT- E651(DE2)-CO-4	Understand and implement different file handling and database operation.
BSIT- E651(DE2)-CO-5	Design and implement text processing, networking and database access in python using various python libraries.

Semester- VI

Course Name: Advance PHP Lab

Course Code (CC): BSIT-E652(DE1)

BSIT- E652(DE1)-CO-1	To illustrate GET and POST request processing by using AJAX technology and JQuery.
BSIT- E652(DE1)-CO-2	To solve complex business logic by using Object oriented programming concepts in PHP
BSIT- E652(DE1)-CO-3	To combine AJAX, DOM and advance java script to manipulate CSS and DOM contents.
BSIT- E652(DE1)-CO-4	To demonstrate use of web API, JSON functionality to create modern web applications.
BSIT- E652(DE1)-CO-5	To solve real world problems by developing interactive web applications using various web technologies and be prepared for IT industry.

Semester- VI

Course Name: Advance JAVA Lab

Course Code (CC): BSIT-E652(DE2)

BSIT- E652(DE2)-CO-1	Understand the working of Java IDE with the advance concepts of programming using various Java IDE like Netbeans, Eclipse.
BSIT- E652(DE2)-CO-2	Design and Develop the fundamentals of Advance Java to create a Web application using Java Server Pages
BSIT- E652(DE2)-CO-3	Analysis of the critical problems of the real-time environment and able to design a new Web application using Java struts with validations.
BSIT- E652(DE2)-CO-4	Learn to create a complex web application with database support and use validation controls on Web-based application using Hibernate.
BSIT- E652(DE2)-CO-5	Develop technical knowledge to design dynamic web sites to meet the current industry requirements using the Spring Framework



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