

**College of Computing Sciences & IT  
Teerthanker Mahaveer University**

**BCA (Bachelor of Computer Applications)**

**Programme Outcome**

<b>PO-1</b>	:	Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives
<b>PO-2</b>	:	Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
<b>PO-3</b>	:	Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.
<b>PO-4</b>	:	Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering
<b>PO-5</b>	:	Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
<b>PO-6</b>	:	Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.
<b>PO-7</b>	:	Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

**Programme Specific Outcome**

<b>PSO-1</b>	:	Understand how to identify, formulate and design solutions in the areas of Computer Science and Application.
<b>PSO-2</b>	:	Demonstrate the abilities to design and develop algorithms and implement them as programs, with analysis and interpretation of data.
<b>PSO-3</b>	:	Develop skills in software development so as to enable the graduates to take up employment/self-employment in local, Indian & global software market.
<b>PSO-4</b>	:	Enhance Employability by developing leadership, effective communication & time management skills and also by incorporating ethics & team work ability.

**Course Outcomes**

<b>BCA107</b>	<b>CO-1</b>	Understanding the peripheral devices and computer generations.
	<b>CO-2</b>	Understanding the basic Concept of operating systems and programming languages.
	<b>CO-3</b>	Understanding the basic functions of Microsoft word and excel.
	<b>CO-4</b>	Understanding the basic functions of Microsoft Power-Point & creating the presentation.
	<b>CO-5</b>	Understanding the categories of programs, system software and

		applications.
	<b>CO-6</b>	Understanding the concepts of Internet, Web resources & networks.
<b>BCA 110</b>	<b>CO-1</b>	Understanding the operations of logic gates, boolean algebra and karnaugh map.
	<b>CO-2</b>	Understanding the working of combinational and sequential circuits.
	<b>CO-3</b>	Understanding the working of register organization and stack organization.
	<b>CO-4</b>	Understanding the concept of Input-Output Organization.
	<b>CO-5</b>	Understanding the layout of memory organization.
<b>BCA 111</b>	<b>CO-1</b>	Understanding the concepts of morals, values, ethics and value education.
	<b>CO-2</b>	Understanding the concept of work ethics and the differences between profession, ethics and happiness.
	<b>CO-3</b>	Analyzing the concepts of trust, spiritualism, and problems related to stress.
	<b>CO-4</b>	Understanding the concept and meaning of Intellectual Property Rights, Cybercrime, Plagiarism and misconduct.
	<b>CO-5</b>	Developing an understanding about e-waste and creating a balance between computer ethics and corporate social responsibility.
<b>TMU 101</b>	<b>CO-1</b>	Understanding environmental problems arising due to constructional and developmental activities.
	<b>CO-2</b>	Understanding the natural resources and suitable methods for conservation of resources for sustainable development.
	<b>CO-3</b>	Understanding the importance of ecosystem and biodiversity and conserving it for maintaining ecological balance.
	<b>CO-4</b>	Understanding the types and adverse effects of various environmental pollutants and their abatement devices.
	<b>CO-5</b>	Understanding green house effect, various environmental laws, movements, different disasters and their management.
<b>TMUGE 101</b>	<b>CO-1</b>	Remembering and understanding the basics of English grammar and building vocabulary for English communication.
	<b>CO-2</b>	Understanding the basic process of communication
	<b>CO-3</b>	Applying correct vocabulary and tenses in sentence construction foreffective communication.
	<b>CO-4</b>	Analyzing self, body-language and social etiquette to build self confidence.
	<b>CO-5</b>	Drafting applications in correct format on common issues
<b>BCA 151</b>	<b>CO-1</b>	Applying the usage of system settings and window's features.
	<b>CO-2</b>	Applying the Microsoft office word to create professional and academic documentation
	<b>CO-3</b>	applying the basic function of MS-excel to prepare the worksheet.
	<b>CO-4</b>	CO-4. Applying the MS-Office power point to create the Power Point
	<b>CO-5</b>	CO-5. Creating and editing database using MS-access.
<b>BCA 153</b>	<b>CO-1</b>	Applying concepts of logic gate and boolean algebra to design combinational circuits.
	<b>CO-2</b>	Applying the working of basic gates and sequential circuits.

	<b>CO-3</b>	Apply the design procedures to design basic sequential circuits.
	<b>CO-4</b>	Applying the concepts of sequential circuits to design flipflops and registers.
	<b>CO-5</b>	Understanding the basic digital circuits and to verify their operation.
<b>TMUGA-101</b>	<b>CO-1</b>	Solving complex problems using Criss cross method, base method and square techniques.
	<b>CO-2</b>	Applying the arithmetical concepts of Average, Mixture and Allegation.
	<b>CO-3</b>	Evaluating the different possibilities of various reasoning based problems in series, Blood relation and Direction.
	<b>CO-4</b>	Operationalizing the inter-related concept of Percentage in Profit Loss and Discount, Si/CI and Mixture/Allegation.
<b>BCA 202</b>	<b>CO-1</b>	Understanding the basics of C programming language, concept of functions and storage classes.
	<b>CO-2</b>	Understanding the concept of arrays, pointers, structure, union and strings along with dynamic memory allocation.
	<b>CO-3</b>	Analyzing concepts of file handling along with C processors.
	<b>CO-4</b>	Understanding a functional hierarchical code organization.
	<b>CO-5</b>	Understanding a defensive programming concept. Ability to handle possible errors during program execution.
<b>BCA 212</b>	<b>CO-1</b>	Understanding the concepts of web technologies, HTML, & Cascading Style Sheet (CSS).
	<b>CO-2</b>	Understanding the concepts of dynamic web pages using Java script, Extensible Markup Language (XML), XSL & XSLT in XML documents.
	<b>CO-3</b>	Understanding & Analyzing various concepts in designing web pages.
	<b>CO-4</b>	Creating the modern web pages using the HTML and CSS features with different layouts as per need of applications.
	<b>CO-5</b>	Creating the modern Web applications using the client and server side technologies and the web design fundamentals.
<b>BCA 215</b>	<b>CO-1</b>	Understanding the concepts of matrix.
	<b>CO-2</b>	Evaluating common applications of Set.
	<b>CO-3</b>	Formulate differentiation of functions.
	<b>CO-4</b>	Familiarity with determinant and matrices.
	<b>CO-5</b>	Evaluating arithmetic and geometric series.
<b>BCA 213</b>	<b>CO-1.</b>	Understanding the concept of management and planning.
	<b>CO-2.</b>	Understanding the importance of organizing with functions of management.
	<b>CO-3.</b>	Analyzing the concept of organizational behavior and understanding the importance of perception and understand the various theories of personality.
	<b>CO-4.</b>	Understanding the concept of leadership and motivation.
	<b>CO-5.</b>	Understanding organizational change and its applicability.
<b>TMUGE 201</b>	<b>CO-1.</b>	Remembering and understanding of the basics of English grammar and vocabulary.
	<b>CO-2.</b>	Understanding the basic of listening, speaking and writing.
	<b>CO-3.</b>	Analyzing different types of listening.

	<b>CO-4.</b>	Understanding concepts of drafting official letters, email, paragraph.
	<b>CO-5.</b>	Understanding concepts of drafting official letters, email, paragraph.
<b>BCA 251</b>	<b>CO-1.</b>	Applying programming concepts of functions and arrays to write compile and debug programs in C language.
	<b>CO-2.</b>	Applying programming concepts of pointers and strings to write compile and debug programs in C language.
	<b>CO-3.</b>	Applying programming concepts of structure and union to write compile and debug programs in C language.
	<b>CO-4.</b>	Understanding a concept of object thinking within the framework of functional model
	<b>CO-5.</b>	Understanding a concept of functional hierarchical code organization.
<b>BCA 255</b>	<b>CO-1</b>	Applying which concepts to create simple web pages using various HTML tags and attributes.
	<b>CO-2.</b>	Applying concepts of CSS to design the layout of web pages.
	<b>CO-3.</b>	Applying concepts of Java script to design dynamic web pages at client side.
	<b>CO-4.</b>	Applying various web technologies in creating customized websites. Styles to the web pages at various levels.
	<b>CO-5.</b>	Understanding the CSS with its types and use them to provide the styles to the web pages at various levels.
<b>TMUGA-201</b>	<b>CO-1.</b>	Applying the arithmetical concepts in Ratio Proportion Variation.
	<b>CO-2.</b>	Employing the techniques of Percentage; Ratios and Average in inter related concepts of Time and Work, Time Speed and Distance.
	<b>CO-3.</b>	Identifying different possibilities of reasoning based problems of Syllogisms and Venn diagram.
	<b>CO-4.</b>	Examining the optimized approach to solve logs and Surds.
<b>BCA 306</b>	<b>CO-1.</b>	Understanding to describe the functionality of operating system.
	<b>CO-2.</b>	Understanding to understand process, its management and synchronization.
	<b>CO-3.</b>	Understanding concept of deadlock, how it is detected and prevented.
	<b>CO-4.</b>	Understanding concept of memory and its management and various processes to manage it.
	<b>CO-5.</b>	Understanding concept of file management and its various techniques.
<b>BCA 309</b>	<b>CO-1.</b>	Understanding the basics of computer network, topology, data communication system and availability of information.
	<b>CO-2.</b>	Understanding the layers of the OSI model and TCP/IP and explain the function of each layer.
	<b>CO-3.</b>	Analyzing the different types of networking protocol and their functionality.
	<b>CO-4.</b>	Analyzing the services and features of the various layers such as Application, Transport of data networks.
	<b>CO-5.</b>	Applying the various protocols studied at different layers in real life application.
<b>BCA 313</b>	<b>CO-1.</b>	Understanding and remembering the basic terminologies, compute
	<b>CO-2.</b>	Analyzing the concept of Data Structures through ADT like stack, queue and linked list, also understand the basic usage and operations

		to be performed on them.
	<b>CO-3.</b>	Understanding, analyzing and applying the learnt concept to solve problems related to various sorting and searching algorithm, later performing a comparative analysis of each one of them.
	<b>CO-4.</b>	Understanding various representations of trees and graphs and analyzing different methods to solve various problems related with them.
	<b>CO-5.</b>	Applying algorithm for solving problems like sorting, searching, insertion and deletion of data.
<b>BCA 314</b>	<b>CO-1.</b>	Understanding the concept and underlying principles of Object-Oriented Programming.
	<b>CO-2.</b>	Understanding how object-oriented concepts are incorporated using C++ programming language.
	<b>CO-3.</b>	Developing problem-solving and programming skills using OOP concept.
	<b>CO-4.</b>	Understanding the benefits of a well structured program.
	<b>CO-5.</b>	Developing the ability to solve real-world problems through software development in high-level programming language like C++ with file handling concept
<b>BCA 308</b>	<b>CO-1.</b>	Understanding what systems are and how they are developed.
	<b>CO-2.</b>	Understanding to describe the role and responsibilities of the systems analyst in the development and management of systems.
	<b>CO-3.</b>	Understanding to identify and describe the phases of the systems development life cycle.
	<b>CO-4.</b>	Understanding to analysis portion of the systems development life cycle in a disciplined manner.
	<b>CO-5.</b>	Understanding to use CASE tools and techniques for process and data modeling.
	<b>CO-6.</b>	Understanding to develop and deliver a requirements definition proposal for a new system in a well-structured business proposal.
<b>BCA 315</b>	<b>CO-1.</b>	Understanding the role of information technology and information systems in business.
	<b>CO-2.</b>	.Understanding the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making.
	<b>CO-3.</b>	Analyzing and synthesize business information and systems to facilitate evaluation of strategic alternatives.
	<b>CO-4.</b>	Effectively communicate strategic alternatives to facilitate decision making.
	<b>CO-5.</b>	Understanding security and control issues in information system
<b>TMUGE 301</b>	<b>CO-1.</b>	Remembering and understanding the English grammar and vocabulary.
	<b>CO-2.</b>	Understanding the art of public speaking and strategies of reading comprehension.
	<b>CO-3.</b>	Applying correct vocabulary and sentence construction during public speaking or professional writing.
	<b>CO-4.</b>	Analyzing different types of sentences like simple, compound and

		complex.
	<b>CO-5.</b>	Drafting notice, agenda and minutes of the meeting.
	<b>CO-6.</b>	Demonstrating speaking skills during common conversation and power point presentation.
<b>BCA 355</b>	<b>CO-1.</b>	Applying the learnt concept for evaluating the operations on arrays, stack, queue and linked list.
	<b>CO-2.</b>	Analyzing and applying the techniques for solving problems related to searching and sorting.
	<b>CO-3.</b>	Understanding the use of array representation.
	<b>CO-4.</b>	Understanding the use of Binary Search Tree and applying the concept to evaluate the operations to be performed on it.
	<b>CO-5.</b>	Understanding and evaluating the time complexities of various algorithms and data structure implemented for solving the problems.
<b>BCA 356</b>	<b>CO-1.</b>	Developing the ability to study the basic concepts of Object oriented Programming. Students will be able to write programs in C++.
	<b>CO-2.</b>	Becoming familiar with the fundamentals and acquire programming skills in the C++ language.
	<b>CO-3.</b>	Developing efficient program for operator and function overloading concept
	<b>CO-4.</b>	Developing efficient program for friend function and virtual function.
	<b>CO-5.</b>	Demonstrate the use of various OOPs concepts with the help of programs.
<b>TMUGA-302</b>	<b>CO-1.</b>	Applying the concepts of modern mathematics Divisibility rule, Remainder Theorem, HCF /LCM in Number System.
	<b>CO-2.</b>	Relating the rules of permutation and combination, Fundamental Principle of Counting to find the probability.
	<b>CO-3.</b>	Applying calculative and arithmetical concepts of ratio, Average and Percentage to analyze and interpret data.
	<b>CO-4.</b>	Correlating the various arithmetic concepts to check sufficiency of data
<b>TMUGS-301</b>	<b>CO-1.</b>	Utilizing effective verbal and non-verbal communication techniques in formal and informal settings
	<b>CO-2.</b>	Understanding and analyzing self and devising a strategy for self growth and development.
	<b>CO-3.</b>	Adapting a positive mindset conducive for growth through optimism and constructive thinking.
	<b>CO-4.</b>	Utilizing time in the most effective manner and avoiding procrastination.
	<b>CO-5.</b>	Making appropriate and responsible decisions through various techniques like SWOT, Simulation and Decision Tree.
	<b>CO-6.</b>	Formulating strategies of avoiding time wasters and preparing todo list to manage priorities and achieve SMART goals.
<b>BCA 402</b>	<b>CO-1.</b>	Applying the concepts of life cycle models to choose the appropriate model.
	<b>CO-2.</b>	Analyzing the requirements and design the software.
	<b>CO-3.</b>	Creating or implementing the software based on the industry standards
	<b>CO-4.</b>	Designing and developing test cases.
	<b>CO-5.</b>	Designing software by applying the software engineering principles.

<b>BCA 407</b>	<b>CO-1.</b>	Understanding the basics of computer graphics and animation, different graphics systems, and applications of computer graphics.
	<b>CO-2.</b>	Understanding various algorithms for line drawing, circle drawing, and filling of bounded objects.
	<b>CO-3</b>	Understanding the geometric transformations on graphics objects and their applications in composite form.
	<b>CO-4.</b>	Understanding different clipping methods and its transformation to graphics display device.
	<b>CO-5.</b>	Analyzing different line, polygon, and text clipping methods.
<b>BCA 416</b>	<b>CO-1.</b>	Understanding the basics of database concepts including design of data models, database architecture and database languages.
	<b>CO-2.</b>	Analyzing the performance of data models using entity relationship model and relational model with the help of E-R diagram, extended E-R diagram, key concepts and integrity constraints.
	<b>CO-3.</b>	Applying the relational database concepts on relational tables with DDL, DML and DCL queries and operations like subqueries, join, union, intersection using SQL.
	<b>CO-4.</b>	Understanding and applying the concept of functional dependency and normalization upto 3NF and BCNF on relational tables with transaction processing, serializability and recovery.
	<b>CO-5.</b>	Understanding and analyzing the concept of concurrency control protocols and locking on database transactions with recovery techniques and database security.
<b>BCA 411</b>	<b>CO-1.</b>	Understanding basic terminology and the fundamentals associated with Hacking in good or bad perspective.
	<b>CO-2.</b>	Remembering with different ways and methodology of Hacking.
	<b>CO-3.</b>	Understanding the nature, class, and platforms to tackle for web and network-based Hacking.
	<b>CO-4.</b>	Understanding to plan tracking and a vulnerability assessment for web-based applications.
	<b>CO-5.</b>	Applying to express the basic understanding of ethical hacking laws and tests.
	<b>CO-6.</b>	Identifying and report on the strengths and vulnerabilities of the tested network
<b>BCA 412</b>	<b>CO-1.</b>	Understanding the basics of computer network, Communication Channels, data communication system and OSI Data Models.
	<b>CO-2.</b>	Understanding the working of cellular Network, Mobile Network Architecture, Base station subsystem, SMS network Architecture.
	<b>CO-3.</b>	Analyzing the basic SMS protocols and creates some basic applications.
	<b>CO-4.</b>	Understanding the 2G Network Architecture, GPRS Architecture, GPRS Protocols, UMTS Spectrum and 3GPP2 Network Architecture.
	<b>CO-5.</b>	Understanding the Wireless Network, Working of Bluetooth wireless networks, learnt about handset manufacturing.
	<b>CO-6.</b>	Understanding and analyzing the handset characteristic; analyzing the different handset models.
<b>BCA 417</b>	<b>CO-1.</b>	Expressing a logic sentence in terms of predicates, quantifiers, and logical connectives and also will be able to apply the rules of

		inference and methods of proof including direct and indirect proof forms, proof by contradiction, and mathematical induction.
	<b>CO-2.</b>	Evaluating Boolean functions and simplify expressions using the properties of Boolean algebra.
	<b>CO-3.</b>	Understanding the concepts of sets, relations and functions to find out the solution of a given problem.
	<b>CO-4.</b>	Understanding the concepts of recurrence relations and generating functions in combinatorics and applying the various counting principles to find out the solution of a given problem.
	<b>CO-5.</b>	Understanding the concepts of graph and tree in discrete structures related to the real life applications with the help of graphs and trees.
<b>BCA 418</b>	<b>CO-1.</b>	Understanding use of Enterprise software, and its role in integrating business functions.
	<b>CO-2.</b>	Analyzing the strategic options for ERP identification and adoption.
	<b>CO-3.</b>	Designing the ERP implementation strategies.
	<b>CO-4.</b>	Creating reengineered business processes for successful ERP implementation.
	<b>CO-5.</b>	Understanding future and scope of Enterprise Integration Application.
<b>BCA 408</b>	<b>CO-1.</b>	Understanding meaning and concepts of accounting.
	<b>CO-2.</b>	Understanding and prepare different type of accounts and accounting books.
	<b>CO-3.</b>	Analyzing the effect of business transactions on an organization's financial records.
	<b>CO-4.</b>	Analyzing and compare inter-organizational and intra-organizational financial records to make appropriate decisions.
	<b>CO-5.</b>	Creating the capacity to understand and convey accounting information to different stakeholders of the organization.
	<b>CO-6.</b>	Use accounting information to solve a variety of business problems.
<b>BCA 414</b>	<b>CO-1.</b>	Understanding the concepts of effective retailing.
	<b>CO-2.</b>	Know the recent trends in retailing in India.
	<b>CO-3.</b>	Possess the knowledge of various retail formats and will be understand the retail customer.
	<b>CO-4.</b>	Understanding the functionality of merchandise management.
	<b>CO-5.</b>	Understanding the relationship marketing strategies.
<b>BCA 415</b>	<b>CO-1.</b>	Understanding digital marketing knowledge to business solutions in local and global environment.
	<b>CO-2.</b>	Identify and applying research digital marketing issues in business situations.
	<b>CO-3.</b>	Identify and applying research digital marketing issues in business situations.
	<b>CO-4.</b>	Effectively communicate digital marketing knowledge in oral and written contexts.
	<b>CO-5.</b>	Critically review digital marketing decisions on the basis of social, environmental and cultural considerations.
<b>BCA 419</b>	<b>CO-1.</b>	Understanding the sales and sales area for effective production, material and quality.
	<b>CO-2.</b>	Understanding the psychology of buyers, recruitment and selection of



		sales force, also to understand the importance of six sigma and quality assurance.
	<b>CO-3.</b>	Applying the process of training, Total Quality Management (TQM), inventory management and apply different sampling techniques.
	<b>CO-4.</b>	Analyzing the process of TQM, quality assurance, six sigma, sales and production outcome.
	<b>CO-5.</b>	Evaluating the sales performance, aggregate planning and work measurement.
	<b>CO-6.</b>	Creating a mechanism of sales oriented, motivated, trained sales force.
<b>TMUGE 401</b>	<b>CO-1.</b>	Remembering and understanding the English grammar and vocabulary.
	<b>CO-2.</b>	Understanding the essentials of effective listening and speaking.
	<b>CO-3.</b>	Understanding the corporate expectations and professional ethics.
	<b>CO-4.</b>	Applying correct vocabulary and sentence construction during professional writing or job interviews.
	<b>CO-5.</b>	Analyzing different types of interviews.
	<b>CO-6.</b>	Drafting resume, C.V. or cover letter.
<b>BCA 454</b>	<b>CO-1.</b>	Understanding and applying DDL queries like Create, Alter, Drop, Truncate and Rename on relational database tables.
	<b>CO-2.</b>	Applying DML queries like Select, Insert, Update and Delete on relational database tables.
	<b>CO-3.</b>	Understanding DCL queries like Grant and Revoke on relational database tables.
	<b>CO-4.</b>	Applying aggregate functions with Group By and Having Clauses.
	<b>CO-5.</b>	Applying and analyzing queries for different types of joins and set operations with the creation of nested subqueries and views.
<b>BCA 453</b>	<b>CO-1.</b>	Applying the line / circle drawing algorithms to draw the line/ circle graphics object by writing C programs.
	<b>CO-2.</b>	Applying the region filling algorithms to fill the bounded region by writing C programs.
	<b>CO-3.</b>	Applying the line clipping algorithms to clip the line against the various clip windows by writing C programs.
	<b>CO-4.</b>	Applying the polygon/ text clipping algorithms to clip the polygon / text against the rectangular clip windows by writing C programs.
	<b>CO-5.</b>	Extracting scene with different clipping methods and its transformation to graphics display device.
<b>TMUGA-402</b>	<b>CO-1.</b>	Recognizing the rules of Crypt-arithmetic and relate them to find out the solutions.
	<b>CO-2.</b>	Illustrating the different concepts of Height and Distance and Functions.
	<b>CO-3.</b>	Employing the concept of higher level reasoning in Clocks, Calendars and Puzzle Problems.
	<b>CO-4.</b>	Correlating the various arithmetic and reasoning concepts in checking sufficiency of data.
<b>TMUGS-401</b>	<b>CO-1.</b>	Communicating effectively in a variety of public and interpersonal settings.
	<b>CO-2.</b>	Applying concepts of change management for growth and development

		by understanding inertia of change and mastering the Laws of Change.
	<b>CO-3.</b>	Communicating effectively in a variety of public and interpersonal settings.
	<b>CO-4.</b>	Functioning in a team and enabling other people to act while encouraging growth and creating mutual respect and trust.
	<b>CO-5.</b>	Handling difficult situations with grace, style, and professionalism
<b>BCA 512</b>	<b>CO-1.</b>	Understanding the detail concept of java in real life.
	<b>CO-2.</b>	Learning how the java is different and easy from other programming languages.
	<b>CO-3.</b>	Analyze the relationship between java and data analysis.
	<b>CO-4.</b>	Understanding java with some modules.
	<b>CO-5.</b>	Understanding how the data is predicted in java.
<b>BCA 519</b>	<b>CO-1.</b>	Understanding the Web-Technology & Development with essential constructs of HTML.
	<b>CO-2.</b>	Understanding the fundamental & differentiation of local and remote host/web-servers.
	<b>CO-3.</b>	Understanding & deep dive towards server-side scripting with PHP essentials & basic constructs.
	<b>CO-4.</b>	Understanding the concept of Client & Server Side Scripting methodologies in view of JavaScript & PHP usage.
	<b>CO-5.</b>	Understanding the concept of dynamic web-development with the usage of MySql RDBMS to create, store and query data from the remote server.
	<b>CO-6.</b>	Understanding the synchronous data exchange from a web server with the usage of AJAX technique.
<b>BCA 515</b>	<b>CO-1.</b>	Understanding the meaning and concepts of entrepreneurship.
	<b>CO-2.</b>	Understanding and apply the concepts and theories of motivation.
	<b>CO-3.</b>	Understanding and analysing different facet and forms of business.
	<b>CO-4.</b>	Understanding, applying and evaluating different financing options.
	<b>CO-5.</b>	Understanding the government support policies and its applications.
	<b>CO-6.</b>	Understanding and applying remedies to sick businesses.
<b>BCA 522</b>	<b>CO-1.</b>	Understanding the basic features of Linux, How to install Linux system and architecture of Linux operating system.
	<b>CO-2.</b>	Understanding the existing Files and Directories of Linux system. Understanding the uses of path and types of path implementation using command line operations.
	<b>CO-3.</b>	Understanding the uses of different command with different parameters. Understand shell meta characters of Linux.
	<b>CO-4.</b>	Understanding the shell programming and the concept of script writing. Understanding the use of different Loops, Decisions, Arithmetic operation, use of commands in Linux.
	<b>CO-5.</b>	Understanding the role and responsibilities of system administrator. Understanding how the user will be created and managed. Understanding the system management like performance monitoring, managing permissions, becoming super user, creating Disk partition, Backup and Restoring the system, installing and removing packages.
<b>BCA 514</b>	<b>CO-1.</b>	Understanding and remembering the basic architecture, goals and

		design issues along with communication in distributed operating system.
	<b>CO-2.</b>	Analyzing and evaluate election algorithms for leader node selection and also to understand the concepts related to deadlock in distributed environment.
	<b>CO-3.</b>	Understanding and evaluate the process, processors and scheduling in distributed system.
	<b>CO-4.</b>	Understanding the concepts of distributed shared memory.
<b>BCA 510</b>	<b>CO-1.</b>	Understanding basics of animation software.
	<b>CO-2.</b>	Examining multimedia applications in several areas.
	<b>CO-3.</b>	Classifying multimedia software based on its function.
	<b>CO-4.</b>	Examining basic principles behind animation and techniques.
	<b>CO-5.</b>	Creating a storyboard for the animation project.
<b>BCA 518</b>	<b>CO-1.</b>	Understanding the concepts of Computer Forensics and its investigation procedures.
	<b>CO-2.</b>	Understanding the working of various storage devices and different methods of data recovery.
	<b>CO-3.</b>	Understanding the concepts of various forensic techniques like Windows, Linux and mobile.
	<b>CO-4.</b>	Understanding the various application password cracking techniques.
	<b>CO-5.</b>	Applying various computer forensic tools to collect digital evidences.
	<b>CO-6.</b>	Understanding the various cyber laws under IT act 2008.
<b>BCA 524</b>	<b>CO-1.</b>	Understanding the fundamentals of game programming, its architecture, state controls and ACTOR management.
	<b>CO-2.</b>	Understanding the role of 3D Graphics, Coordinate Systems, Rasterization, Illumination and Texturing in developing animated games.
	<b>CO-3.</b>	Understanding the game design principles such as character development and core mechanics used for designing and developing of 3D animated game.
	<b>CO-4.</b>	Applying the techniques of rendering, controlling, sorting and collision detection in designing game engine.
	<b>CO-5.</b>	Understanding the importance of various frameworks and platforms such as Adventure Game Studio in designing games.
	<b>CO-6.</b>	Understanding the basic principles, importance of tools like OpenGL and DirectX in game development.
<b>BCA 551</b>	<b>CO-1.</b>	Understanding the phases of SDLC and performing initial investigation about project.
	<b>CO-2.</b>	Understanding to design ER-Diagram and DFD of the project.
	<b>CO-3.</b>	Applying the designing procedures to design database.
	<b>CO-4.</b>	Creating SRS Document for the project.
	<b>CO-5.</b>	Creating Forms and Front end of the Project.
<b>BCA 555</b>	<b>CO-1.</b>	Understanding the execution of java in real life.
	<b>CO-2.</b>	Implementing the different modules to predict data.
	<b>CO-3.</b>	Executing different functions to search pattern in the files.

	<b>CO-4.</b>	Analyzing the data from different datasets with different modules.
	<b>CO-5.</b>	Creating event handling on various components.
<b>BCA 558</b>	<b>CO-1.</b>	Implementing the Web-Scripts with essential constructs of HTML.
	<b>CO-2.</b>	Implementing server-side scripting by hands-on practice of basic PHP development.
	<b>CO-3.</b>	Implementing web-scripts in PHP for file handling operations.
	<b>CO-4.</b>	Creating a web-script with database like MySql for creating, storing and querying data live.
	<b>CO-5.</b>	Applying live CRUD operations with PHP-MySql for developing Create, Read, Update and Delete operations over web server on the database.
	<b>CO-6.</b>	Implementing asynchronous data exchange between web-application and database server with AJAX technique.
<b>BCA 559</b>	<b>CO-1.</b>	Developing the ability to install Linux operating system (Ubuntu).
	<b>CO-2.</b>	Developing the ability to install Linux operating system (Ubuntu).
	<b>CO-3.</b>	Developing the ability to use different process controlling commands. Develop the ability to write find command with different parameters to search files.
	<b>CO-4.</b>	Developing the ability to write shell programming to solve different problems.
	<b>CO-5.</b>	Developing the ability to analyze system performance, to create and restore backup, to create and manage user and group.
<b>BCA 560</b>	<b>CO-1.</b>	Creating and analyzing distributed shared memory and Client Server based programs.
	<b>CO-2.</b>	Applying the learnt concepts for implementing different algorithms for loader node selection.
	<b>CO-3.</b>	Applying and evaluating the demonstration of centralized and distributed deadlock.
	<b>CO-4.</b>	Creating distributed server mechanism and evaluate various RPC techniques.
	<b>CO-5.</b>	Creating distributed application on case based study.
<b>BCA 561</b>	<b>CO-1.</b>	Understanding about multimedia authoring, paradigm and tools.
	<b>CO-2.</b>	Developing audio digitization, audio file format and audio software.
	<b>CO-3.</b>	Developing digital video standards, formats and technology.
	<b>CO-4.</b>	Creating a photo gallery using transition effect.
	<b>CO-5.</b>	Creating a picture transformation effect.
<b>BCA 562</b>	<b>CO-1.</b>	Applying computer forensic tools and techniques to identify, collect, secure and preserve digital evidences.
	<b>CO-2.</b>	Applying basic and networking commands of Linux and windows operating system.
	<b>CO-3.</b>	Applying various software's for password cracking.
	<b>CO-4.</b>	Applying various software's for password cracking.
	<b>CO-5.</b>	Analysing plain text using cryptography and steganography.
	<b>CO-6.</b>	Applying disk manager or partition magic technique on hard disk for creating, deleting, rename and resize the disk partition.
<b>BCA 563</b>	<b>CO-1.</b>	Understanding the commonly available Frameworks and IDE's for game development and their hardware requirement.
	<b>CO-2.</b>	Applying different game elements for designing the concept of game.

	<b>CO-3.</b>	Identifying the proper framework and tools for designing specific type of games.
	<b>CO-4.</b>	Applying the DirectX and python for developing 2D interactive games.
	<b>CO-5.</b>	Applying the unity Game engine for developing a level in the game.
<b>BCA 609</b>	<b>CO-1.</b>	Understanding the basics of programming with C#.
	<b>CO-2.</b>	Understanding the meaning and basic components of a programming with C#.
	<b>CO-3.</b>	Applying hands-on use of programming with C# applications in Web, Window and Console Application.
	<b>CO-4.</b>	Identifying categories of programs, Web, Window and Console Application. Organize and work with many projects.
	<b>CO-5.</b>	Completion of the assignments will result programming with C# applications knowledge and skills.
<b>BCA 610</b>	<b>CO-1.</b>	Understanding the Android operating system, its features along with its architecture, Android Studio, Android Virtual Device makes student familiar with Android operating system and its SDK .
	<b>CO-2.</b>	Becoming familiar with Activities, Intents, Fragments through which students will be able to code the behavior of basic Android Application.
	<b>CO.3</b>	Becoming familiar with Views like Button TextView, WebView, ImageView, Spinner etc. through which students will be able to design the user interface of Android Application.
	<b>CO-4.</b>	Developing the ability to understand the different storage options like SQLite, Shared Preferences, available in Android Application development along with data sharing option like Content Provider.
	<b>CO-5.</b>	Developing the ability in students to understand the concept of Services, Location Based Services, JSON, and develop Android Applications like Music player using Services, Weather forecast using JSON, Location Tracker using Google Map.
<b>BCA 614</b>	<b>CO-1.</b>	Understanding and remembering programming skills in core Python.
	<b>CO-2.</b>	Understanding Object Oriented Skills in Python.
	<b>CO-3.</b>	Creating the skill of designing user defined functions in python.
	<b>CO-4.</b>	Creating the ability to work on modules in python.
	<b>CO-5.</b>	Understanding of important aspects related with string, lists and dictionary in python.
<b>BCA 660</b>	<b>CO-1.</b>	Understanding the process of Project development.
	<b>CO-2.</b>	Understanding the flow of Processes in the project.
	<b>CO-3.</b>	Applying the knowledge to develop applications based on SRS Document.
	<b>CO-4.</b>	Applying the learning to develop applications on different platforms like Window, Web based or Mobile based applications to specific set of problem and their solutions.
	<b>CO-5.</b>	Applying the test cases for testing of the project.
	<b>CO-6.</b>	Analyzing the different roles required in project development.
<b>BCA 657</b>	<b>CO-1.</b>	Recognizing when to use each of the programming with C# programs to create professional, academic, business and many software projects.
	<b>CO-2.</b>	Understanding programming with C# programs to create personal, academic and business documents following current professional

		and/or industry standards.
	<b>CO-3.</b>	Applying skills and concepts for basic use of computer hardware, software, networks and the internet in the workplace.
	<b>CO-4.</b>	Applying coursework as identified by the internationally accepted Internet and Microsoft Core programming with C# standards.
	<b>CO-5.</b>	Creating window based application.
<b>BCA 658</b>	<b>CO-1.</b>	Developing the ability to understand the basic concepts of Android application development.
	<b>CO-2.</b>	Becoming familiar with the fundamentals and acquire programming skills in Android.
	<b>CO-3.</b>	Developing application of location Tracker using Google Map.
	<b>CO-4.</b>	Developing efficient basic Android application like Calculator, Temperature Conversion etc.
	<b>CO-5.</b>	Able to start writing own Android applications.
<b>BCA 659</b>	<b>CO-1.</b>	Applying core python programming like loop, if statement and other concept.
	<b>CO-2.</b>	Applying different collections - list, tuple, dictionaries.
	<b>CO-3.</b>	Creating class, inheritance and operator overloading.
	<b>CO-4.</b>	Creating and importing modules.