

Bachelor in Science (B.Sc(CS))

Program Objectives:

- Effectively communicating computing concepts and solutions to bridge the gap between computing industry experts and business leaders to create and initiate innovation
- Effectively utilizing their knowledge of computing principles and mathematical theory to develop sustainable solutions to current and future computing problems.
- Exhibiting their computing expertise within the computing community through corporate leadership, entrepreneurship, and/or advanced graduate study
- Developing and implementing solution based systems and/or processes that address issues and/or improve existing systems within in a computing based industry

Subject wise Course objective and Course Outcome

S No.	Name of Subject	Course objective	Course Outcome
1.	Algebra & Trigonometric	<ul style="list-style-type: none"> ➤ Work with matrices and determine if a given square matrix is invertible. ➤ Learn to solve systems of linear equations and application problems requiring them. 	<ul style="list-style-type: none"> ➤ Find the inverse of a square matrix. ➤ Solve the matrix equation $Ax = b$ using row operations and matrix operations. ➤ Find the determinant of a product of square matrices, of the transpose of a square matrix, and of the inverse of an invertible matrix
2.	Calculus	<ul style="list-style-type: none"> ➤ Use the fact that the derivative is the slope of the tangent line to the curve at a given point to help determine the derivatives of simple linear functions. ➤ Determine whether the equation of a function given is differentiable or continuous at a particular value of x. ➤ Determine the information from a graph that when the second derivative is positive the graph is concave upward, when the second 	<ul style="list-style-type: none"> ➤ understand the relationship between the derivative and the definite integral as expressed in both parts of the Fundamental Theorem of Calculus. ➤ locate the x and y intercepts, any undefined points, and any asymptotes. ➤ determine asymptotes for rational expressions (we will not go into these graphs in much detail). ➤ apply the techniques from the

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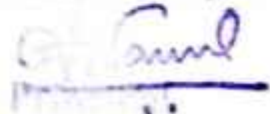
		<p>derivative is negative the graph is concave downward, and when there is a switch in sign there is an inflection point.</p> <ul style="list-style-type: none"> ➤ Understand the various forms of a line including: standard form, point slope form, and slope intercept form. ➤ Calculate definite integrals that may involve logarithms, exponentials, polynomials, and powers by using the Fundamental Theorem of Calculus. 	<p>previous section to graph a fourth degree polynomial or higher</p> <ul style="list-style-type: none"> ➤ determine if there is any symmetry to aid in the graphing process. ➤ determine the point(s) of intersection of pairs of curves.
	Vector Analysis & Geometrics	<ul style="list-style-type: none"> ➤ Define vector fields. ➤ Calculate line integrals along piecewise smooth paths; interpret such quantities as work done by a force . ➤ To understand the concepts & advance topics related to two & three dimensional geometry. 	<ul style="list-style-type: none"> ➤ Memorize definition of directional derivative and gradient and illustrate geometric meanings with the aid of sketches. ➤ Memorize theorem relating directional derivative to gradient and reproduce proof. ➤ use geometrical results to determine unknown angles
	Mechanics Oscillation & properties of Matter	<ul style="list-style-type: none"> ➤ This course would empower the student to acquire engineering skills and practical knowledge, which help the student in their everyday life. This syllabus will cater the basic requirements for their higher studies. This course will provide a theoretical basis for doing experiments in related areas. 	<ul style="list-style-type: none"> ➤ This course would empower the student to acquire engineering skills and practical knowledge, theoretical basis for doing experiments in related areas, which help the student in their everyday life. Students will gain basic knowledge for their higher studies..
	Electricity, Magnetism and Electromagnetic Theory	<ul style="list-style-type: none"> ➤ This paper deals with the study of Electric field, Magnetic field, and Electromagnetic theory. ➤ The first unit gives the mathematical idea behind the electrostatic field. ➤ The second unit deals with the physics behind the Magnetostatics. 	<ul style="list-style-type: none"> ➤ Explain various phenomenon like Ferromagnetism, ant ferromagnetism etc. ➤ Understand the relation in between Electromagnetic theory. ➤ Explain various phenomenon in light of maxwell equations.

		<ul style="list-style-type: none"> ➤ Last unit deals with the electromagnetic theory. 	
6.	Programming in C	<ul style="list-style-type: none"> ➤ To introduce students to a powerful programming language – C. ➤ To understand the basic structure of a C program. ➤ To gain knowledge of various programming errors. ➤ To enable the students to make flowchart and design an algorithm for a given problem. ➤ To enable the students to develop logics and programs. 	<ul style="list-style-type: none"> ➤ In-depth understanding of various concepts of C language. ➤ Ability to read, understand and trace the execution of programs. ➤ Skill to debug a program. ➤ Skill to write program code in C to solve real world problems
7.	Computer Fundamental	<ul style="list-style-type: none"> ➤ To impart knowledge about the structure, components and functions of a computer system. ➤ To understand working of basic input and output devices. 	<ul style="list-style-type: none"> ➤ Familiarization with the terms like Operating System, peripheral devices, networking, multimedia, internet etc. ➤ Ability to use internet for searching information on web, sending e-mails and many other tasks.
8.	Environmental Studies	<ul style="list-style-type: none"> ➤ To create awareness about environmental issues. ➤ To nurture the curiosity of students particularly in relation to natural environment. ➤ To develop an attitude among students to actively participate in all the activities regarding environment protection. ➤ To develop skills for identifying and solving environmental problems. 	<ul style="list-style-type: none"> ➤ Critical thinking in relation to environmental affairs. ➤ Understanding about interdisciplinary nature of environmental issues. ➤ Independent research regarding environmental problems in form of project report. ➤ Understand social interactions by which human behave and cultural values that underlay behaviors.
9	Foundation Course	<ul style="list-style-type: none"> ➤ To enable the learner to communicate effectively and appropriately in real life situation. 	<ul style="list-style-type: none"> ➤ Reading Skills:- Ability to read English with ability to read English with understanding and decipher

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		<ul style="list-style-type: none"> ➤ To use English effectively for study purpose across the curriculum. ➤ To develop and integrate the use of four language skills: <ol style="list-style-type: none"> a) Reading b) Writing c) Listening d) Speaking <p>To revise and reinforce structure already learnt</p>	<p>paragraph patterns, writer techniques and conclusions.</p> <ul style="list-style-type: none"> ➤ Writing Skills:- Skill to develop the ability to write English correctly and master the mechanics of writing the use of correct punctuation marks and capital letter. ➤ Listening Skills:- Ability to understand English when it is spoken in various contexts. ➤ Speaking Skills:- Develop the ability to speak intelligibly using appropriate word stress, sentence stress and elementary intonation patterns
	Foundation Course Hindi	<ul style="list-style-type: none"> ➤ To Understand the meaning concept and importance of Hindi. ➤ To Understand various forms of Hindi according to its area of application. ➤ To Understand various forms of reading and writing of Hindi 	<ul style="list-style-type: none"> ➤ To Understand the basic Concept of Hindi. ➤ To Understand various aspect of Hindi literature with a process to reach method and giving new mode and direction. ➤ To make a attempt in different area and theory such as vocabulary and Vice Versa.
10	Advance Calculus	<ul style="list-style-type: none"> ➤ To understand Different indeterminate forms of limit. ➤ Calculate functional value in neighbourhood of some point using expansions. ➤ To understand the behaviour of curve in space. ➤ Continuity and Limits - Prove convergence and divergence of limits using the ϵ-δ definition. ➤ Differentiation - Identify and prove basic facts about derivatives and their properties. ➤ To understand the maximum and minimum behaviour of a function of two variables. 	<ul style="list-style-type: none"> ➤ The student is expected to learn about the basic principles of multi-variable calculus with proofs. ➤ To have full knowledge of calculus involving the fundamental tools such as continuity and differentiability. ➤ Students are able to reason rigorously in mathematical arguments. They can follow abstract mathematical arguments and write their own proofs. ➤ Students are able to effectively communicate mathematics: reading, writing, listening, and speaking. Students make effective use of the library,

			<p>conduct research and make oral and written presentations of their findings.</p> <ul style="list-style-type: none"> ➤ To know Relationship between the increasing and decreasing behavior of f and the sign off
11	Differential Equations	<ul style="list-style-type: none"> ➤ Evaluate first order differential equations including separable, homogeneous, exact, and linear. ➤ Show existence and uniqueness of solutions. ➤ Solve second order and higher order linear differential equations. ➤ Create and analyze mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits. ➤ Solve differential equations using variation of parameters ➤ Solve linear systems of ordinary differential equations 	<ul style="list-style-type: none"> ➤ Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. ➤ Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. ➤ Student will be introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients. ➤ Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters. ➤ Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
12	Mechanics	<ul style="list-style-type: none"> ➤ Determine the centre of gravity of some materialistic systems and discuss the equilibrium of a uniform cable hanging freely under its own weight. 	<ul style="list-style-type: none"> ➤ Familiarize with subject matter, which has been the single centre, to which were drawn mathematicians, physicists, astronomers, and engineers together. ➤ Understand necessary conditions for the equilibrium of particles acted upon by various forces and learn the principle of virtual work for a system of coplanar forces


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			<p>acting on a rigid body.</p> <ul style="list-style-type: none"> ➤ Determine the centre of gravity of some materialistic systems and discuss the equilibrium of a uniform cable hanging freely under its own weight. ➤ Deal with the kinematics and kinetics of the rectilinear and planar motions of a particle including the constrained oscillatory motions of particles. ➤ Learn that a particle moving under a central force describes a plane curve and know the Kepler's laws of the planetary motions, which were deduced by him long before the mathematical theory given by Newton.
13	Thermodynamics, Kinetic Theory and statistical physics	<ul style="list-style-type: none"> ➤ Student learns the different laws of thermodynamics. ➤ To learn thermo-dynamical functions and there relations ➤ To determine axial forces, shear forces and bending moments. ➤ To express the relationship between the pressure and the average kinetic energy of gas molecules in the form of equation ➤ To express the five basic assumptions of the Kinetic Molecular Theory of Gases. 	<ul style="list-style-type: none"> ➤ Understand the concept of thermodynamics and there laws. ➤ Understand the Heat Engine and there uses. ➤ Describe the thermodynamic function and there relations
14	Waves, Acoestics and optics	<ul style="list-style-type: none"> ➤ The main objective of this subject is to aware the students about various phenomenon of waves and optics. ➤ First unit of deals with the Fourier analysis and Fourier transformation. 3. The second deals with the matrix method in order to explain various phenomenon. ➤ The third unit describe the Phenomenon like interference phenomenon. 	<ul style="list-style-type: none"> ➤ Understand the physics behind various phenomenon in wave and optics. ➤ Understand various phenomenon and the cause or origin of them. ➤ Explain the relationship in between various optical phenomenon with the Fourier series and matrix.
15	Computer Software	<ul style="list-style-type: none"> ➤ To give an overview of benefits of Object Oriented Programming 	<ul style="list-style-type: none"> ➤ Familiarization with a widely used programming concept -

		<p>(OOP) approach over the Traditional Programming approach.</p> <ul style="list-style-type: none"> ➤ To deliver comprehensive view of OOP concept. 	<p>Object Oriented Programming.</p> <ul style="list-style-type: none"> ➤ Develop logical thinking. ➤ Skill to write codes in C++ by applying concept of OOP, such as Objects, Classes, Constructors, Inheritance etc., to solve mathematical or real world problems. ➤ Use knowledge of HTML and CSS code and an HTML editor to create personal and/or business websites following current professional and/or industry standards. Use critical thinking skills to design and create websites.
16	Computer Hardware	<ul style="list-style-type: none"> ➤ The emphasis is on the design concepts & organisational details of the common PC, leaving the complicated electronics of the system of the computer Engineers. 	<ul style="list-style-type: none"> ➤ To introduce the overall organisation of the microcomputers. ➤ To introduce the common peripheral devices used in computers. ➤ To introduce the hardware components, use of micro processor and function of various chips used in microcomputer.
17	Analysis	<ul style="list-style-type: none"> ➤ Define the real numbers, least upper bounds, and the triangle inequality. ➤ Define functions between sets; equivalent sets; finite, countable and uncountable sets. Recognize convergent, divergent, bounded, Cauchy and monotone sequences. ➤ Calculate the limit superior, limit inferior, and the limit of a sequence. ➤ Recognize alternating, convergent, conditionally and absolutely convergent series. ➤ Determine if subsets of a metric space are open, closed, connected, bounded, totally bounded and/or compact. ➤ Determine if a function on a metric space is discontinuous, continuous, or uniformly 	<ul style="list-style-type: none"> ➤ describe fundamental properties of the real numbers that lead to the formal development of real analysis. ➤ comprehend rigorous arguments developing the theory underpinning real analysis. ➤ demonstrate an understanding of limits and how they are used in sequences, series, differentiation and integration. ➤ construct rigorous mathematical proofs of basic results in real analysis. ➤ appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.

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18	Abstract Algebra	<p>continuous.</p> <ul style="list-style-type: none"> ➤ Solve systems of linear equations, ➤ Analyze vectors in R^n geometrically and algebraically, ➤ Recognize the concepts of the terms span, linear independence, basis, and dimension, and apply these concepts to various vector spaces and subspaces, ➤ Use matrix algebra and the related matrices to linear transformations, ➤ Compute and use determinants. 	<ul style="list-style-type: none"> ➤ Identify and construct linear transformations of a matrix. ➤ Characterize linear transformations as onto, one-to-one. ➤ Solve linear systems represented as linear transforms. ➤ Express linear transforms in other forms, such as as matrix equations, and vector equations.
19	Discrete Mathematics	<ul style="list-style-type: none"> ➤ To understand and solve discrete mathematical problems. ➤ To impart knowledge regarding relevant topics such as set Theory, basic logic, graphs, trees or discrete probability. ➤ To familiarize students with linear Algebra, differential and integral calculus, numerical methods and statistics. 	<ul style="list-style-type: none"> ➤ Develops formal reasoning. ➤ Creates habit of raising questions. ➤ Knowledge regarding the use of Discrete Mathematics in Computer Science. ➤ Helpful in formulating questions. ➤ Ability to communicate knowledge, capabilities and skills related to the computer engineer profession.
20	Solid State Physics, Solid State Devices and electron gbics	<ul style="list-style-type: none"> ➤ Describe the difference between crystalline and amorphous materials. ➤ Describe the arrangement of atoms and ions in crystalline structures. ➤ Schematically diagram face-centered cubic, body-centered cubic and hexagonal closepacked unit cells. ➤ Recognize and also give the lattice parameter relationships for all seven crystal systems--i.e., cubic, hexagonal, tetragonal, rhombohedral, orthorhombic, monoclinic, and triclinic. ➤ Given a unit cell and the Miller indices for a plane, draw the plane represented by these indices referenced to this unit cell. 	<ul style="list-style-type: none"> ➤ Demonstrate an understanding of the crystal lattice and how the main lattice types are described. ➤ formulate the theory of X-ray diffraction in the reciprocal lattice (k-space) formalism and apply this knowledge to generalize the formulation for matter waves be able to perform structure determination of simple structures . ➤ Learn that Dulong-Petit Law is valid only at high temperature.

		<ul style="list-style-type: none"> ➤ Given the unit cell for some crystal structure, be able to draw the atomic packing arrangement for a specific crystallographic plane. 	
21	Relativity, Quantum Mechanics, Atomic Molecular	<ul style="list-style-type: none"> ➤ To study the basic principles of quantum mechanics. ➤ Explain the operator formulation of quantum mechanics. ➤ Student learn the concept of wave function. ➤ Student will learn Schrodinger equation and their applications. ➤ To study role of uncertainty in quantum physics. 	<ul style="list-style-type: none"> ➤ Pinpoint the historical aspects of development of quantum mechanics. ➤ Understand and explain the differences between classical and quantum mechanics. ➤ Understand the idea of wave function. ➤ Understand the uncertainty relations. ➤ Solve Schrodinger equation for simple potentials.
22	Computer Software	<ul style="list-style-type: none"> ➤ To introduce Data Base Management System concepts. ➤ To introduce the Relational Database Management System and Relational Database Design. ➤ To introduce the RDBMS software and utility of query language. ➤ To introduce basic concept of GUI Programming and database connectivity using Visual Basic 	<ul style="list-style-type: none"> ➤ Familiarization with Database Management System. ➤ Comprehensive knowledge of database models. ➤ Ability to code database transactions using SQL. ➤ Skill to write PL/SQL programs
23	Computer Hardware	<ul style="list-style-type: none"> ➤ Indicate the names and functions of hardware ports and the parts of the motherboard. ➤ Identify the names and distinguishing features of different kinds of input and output devices. ➤ Describe how the CPU processes data and instructions and controls the operation of all other devices. ➤ Identify the names, distinguishing features, and units for measuring different kinds of memory and storage devices. 	<ul style="list-style-type: none"> ➤ To introduce the overall organisation of the microcomputers and operating systems. ➤ To introduce the interaction of common devices used with computers with operating softwares, excluding the Assembly languages, with special reference to DOS/WINDOWS. ➤ To introduce the working of hardware components, Micro-Processor and various chips

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Bachelor in Science (B.Sc(CS))

Program Objectives:

- Effectively communicating computing concepts and solutions to bridge the gap between computing industry experts and business leaders to create and initiate innovation
- Effectively utilizing their knowledge of computing principles and mathematical theory to develop sustainable solutions to current and future computing problems.
- Exhibiting their computing expertise within the computing community through corporate leadership, entrepreneurship, and/or advanced graduate study
- Developing and implementing solution based systems and/or processes that address issues and/or improve existing systems within in a computing based industry

Subject wise Course objective and Course Outcome

S No.	Name of Subject	Course objective	Course Outcome
1.	Algebra & Trigonometric	<ul style="list-style-type: none"> ➤ Work with matrices and determine if a given square matrix is invertible. ➤ Learn to solve systems of linear equations and application problems requiring them. 	<ul style="list-style-type: none"> ➤ Find the inverse of a square matrix. ➤ Solve the matrix equation $Ax = b$ using row operations and matrix operations. ➤ Find the determinant of a product of square matrices, of the transpose of a square matrix, and of the inverse of an invertible matrix
2.	Calculus	<ul style="list-style-type: none"> ➤ Use the fact that the derivative is the slope of the tangent line to the curve at a given point to help determine the derivatives of simple linear functions. ➤ Determine whether the equation of a function given is differentiable or continuous at a particular value of x. ➤ Determine the information from a graph that when the second derivative is positive the graph is concave upward, when the second 	<ul style="list-style-type: none"> ➤ understand the relationship between the derivative and the definite integral as expressed in both parts of the Fundamental Theorem of Calculus. ➤ locate the x and y intercepts, any undefined points, and any asymptotes. ➤ determine asymptotes for rational expressions (we will not go into these graphs in much detail) ➤ apply the techniques from the

Post Graduation Diploma in Computer Application (PGDCA)

Program Objectives:

- It will equip the students with skills required for designing, developing applications in Information Technology.
- Students will be able to learn the latest trends in various subjects of computers & information technology.
- The PG Diploma is aimed at graduates with a computing background and provides a detailed coverage of the key concepts and challenges in data and resource protection and computer software security.
- To give hands on to students while developing real life IT application as part of the study.
- To train graduate students in basic computer technology concepts and information technology applications.
- Design and develop applications to analyze and solve all computer science related problems.

Subject wise Course objective and Course Outcome

S No.	Name of Subject	Course objective	Course Outcome
1.	Software Organization	<ul style="list-style-type: none"> ➤ To impart knowledge about the structure, components and functions of a computer system. ➤ To understand working of basic input and output devices. ➤ To give an in-depth understanding of role of computers in business, education and society. 	<ul style="list-style-type: none"> ➤ Familiarization with the terms like Operating System, peripheral devices, networking, multimedia, internet etc. ➤ Ability to use internet for searching information on web, sending e-mails and many other tasks.
2.	Programming in 'C'	<ul style="list-style-type: none"> ➤ To introduce students to a powerful programming language – C. ➤ To understand the basic structure of a C program. ➤ To gain knowledge of various programming errors. ➤ To enable the students to make flowchart and design an algorithm for a given problem. ➤ To enable the students to develop logics and programs. 	<ul style="list-style-type: none"> ➤ In-depth understanding of various concepts of C language. ➤ Ability to read, understand and trace the execution of programs. ➤ Skill to debug a program. ➤ Skill to write program code in C to solve real world problems.
3.	Office Automation	<ul style="list-style-type: none"> ➤ To learn about the binary number representation along with its 	<ul style="list-style-type: none"> ➤ Familiarization with the terms like Operating Operating System,

		<p>operations.</p> <ul style="list-style-type: none"> ➤ To give detailed knowledge of MS-Office. ➤ To give an in-depth understanding of role of computers in business, education and society. 	<p>peripheral devices, networking, multimedia, internet etc.</p> <ul style="list-style-type: none"> ➤ Ability to use internet for searching information on web, sending e-mails and many other tasks. ➤ Skill to work with MS-Word, Excel and PowerPoint. ➤ Initiation into the process of writing business letters or job applications, tabulating data, preparing PPTs etc using MS-Office.
4.	Visual Basic	<ul style="list-style-type: none"> ➤ To prepare students to acquire front end development skills using Visual Basic. The students can be able to build the front end application using the latest industry required technology. 	<ul style="list-style-type: none"> ➤ Understand an overview of computers and computer programming. ➤ Understand the concept of data-driven program execution flow control in Visual Basic programming.
5.	DBMS	<ul style="list-style-type: none"> ➤ It aims at acquainting students better with the basics of DBMS, different Architectural Models for DBMS, Normalization of data, Concurrency control problems and its management, Protection, Security and recovery aspects of databases along with practical knowledges of databases using SQL and PL/SQL. ➤ The key goal is to prepare students for a professional career in the field of data administration and database design. ➤ To get acquaint students with good knowledge of DBMS. During the course, students will learn about database design and database handling activities. Learn how to identify an organization's information processing requirements. ➤ Learn how to develop a detailed specification for an information system that can fulfil these requirements. 	<ul style="list-style-type: none"> ➤ Knowledge & Understanding Databases and their design & development . ➤ Intellectual Cognitive/analytical skills: Normalization of Databases. ➤ Practical Skills :Using SQL and PL/SQL. ➤ Transferable skills: Usage of DBMS design and administration. ➤ gather data to analyse and specify the requirements of a system.

		<ul style="list-style-type: none"> ➤ Understand that the successful systems analyst needs to have a broad understanding of organizations, organizational culture, organizational change, organizational operations, and business processes. 	
6.	E-Commerce	<ul style="list-style-type: none"> ➤ The primary goal is to prepare students for practical use of internet for online transactions like use of e-banking . ➤ To get good knowledge of various modes of online payment using various apps. ➤ Also you can learn various security mechanisms. ➤ Teaches students the basic concept of Web pages, how to design WebPages. 	<ul style="list-style-type: none"> ➤ Demonstrate an understanding of the foundations and importance of E-commerce. ➤ Demonstrate an understanding of retailing in E-commerce by analyzing branding and pricing strategies, using and determining the effectiveness of market research assessing the effects of disintermediation. ➤ Analyze the impact of E-commerce on business models and strategy. ➤ After completion of this course, students will be able to understand the basic concept of Web pages, design of Webpages,

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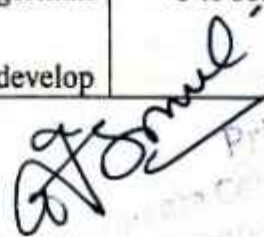
Bachelor in Computer Application (BCA)

Program Objectives:

- The OBJECTIVE of the course is to develop skilled manpower in the various areas of software industry and Information Technology
- BCA course strives to create outstanding computer professionals with ethical and human values to reshape the nation's destiny. This program aims to prepare young minds for the challenging opportunities in the IT industry, nourished and supported by experts in the fields.
- The program enhances analytical, managerial and communication skill besides inculcating the virtues of self-study. The Curriculum has been designed to cater to the ever changing demands of information technology along with necessary inputs from the Industry.
- The BCA Course aims at inculcating essential skills as demanded by the global software industry through interactive learning process. This also includes team-building skills, audio- visual presentations and personality development programs.
- To enable students for pursuing respectable career through Self- Employment, Executive Employment, Entrepreneurship, Professional Career in the field of service sectors such as e-Banking, Marketing, Investment, Insurance hospitality and other avenues.
- To develop the basic programming skills to enable students to build Utility programs.
- To develop the foundation for higher studies in the field of Computer Application.
- To provide specialization in Management with technical, professional and communications skills.

Subject wise Course objective and Course Outcome

S No.	Name of Subject	Course objective	Course Outcome
1.	Discrete Mathematics	<ul style="list-style-type: none"> ➤ To understand and solve discrete mathematical problems. ➤ To impart knowledge regarding relevant topics such as set Theory, basic logic, graphs, trees or discrete probability. ➤ To familiarize students with linear Algebra, differential and integral calculus, numerical methods and statistics. 	<ul style="list-style-type: none"> ➤ Develops formal reasoning. ➤ Creates habit of raising questions. ➤ Knowledge regarding the use of Discrete Mathematics in Computer Science. ➤ Helpful in formulating questions. ➤ Ability to communicate knowledge, capabilities and skills related to the computer engineer profession.
2.	PC Package and Multimedia	<ul style="list-style-type: none"> ➤ To learn about the binary number representation along with its operations. ➤ To give detailed knowledge of MS-Office. ➤ To give an in-depth understanding of role of computers in business, education and society. 	<ul style="list-style-type: none"> ➤ Familiarization with the terms like Operating System, peripheral devices, networking, multimedia, internet etc. ➤ Ability to use internet for searching information on web, sending e-mails and many other tasks. ➤ Skill to work with MS-Word, Excel and PowerPoint. ➤ Initiation into the process of writing business letters or job applications, tabulating data, preparing PPTs etc using MS-Office.
3.	Programming in C	<ul style="list-style-type: none"> ➤ To introduce students to a powerful programming language – C. ➤ To understand the basic structure of a C program. ➤ To gain knowledge of various programming errors. ➤ To enable the students to make flowchart and design an algorithm for a given problem. ➤ To enable the students to develop 	<ul style="list-style-type: none"> ➤ In-depth understanding of various concepts of C language. ➤ Ability to read, understand and trace the execution of programs. ➤ Skill to debug a program. ➤ Skill to write program code in C to solve real world problems.


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		logics and programs.	
4.	WEB Technology	<ul style="list-style-type: none"> ➤ To learn various Web Technologies. ➤ To enable the students to design and implement static and dynamic Web pages. ➤ To acquire fundamental skills to maintain web server services required to host a website. ➤ To learn MySQL. 	<ul style="list-style-type: none"> ➤ Ability to develop web pages using HTML and Cascading Style Sheets. ➤ Skill to create XML documents and Schemas. ➤ Knowledge of client-side (JavaScript) and server-side scripting (PHP, ASP.NET) languages to build dynamic web pages. ➤ Familiarization with Web Application Terminologies, Internet Tools, E – Commerce and other web services. ➤ Ability to develop database applications with MySQL.
5.	Computer Fundamental	<ul style="list-style-type: none"> ➤ To impart knowledge about the structure, components and functions of a computer system. ➤ To understand working of basic input and output devices. ➤ To give an in-depth understanding of role of computers in business, education and society. 	<ul style="list-style-type: none"> ➤ Familiarization with the terms like Operating System, peripheral devices, networking, multimedia, internet etc. ➤ Ability to use internet for searching information on web, sending e-mails and many other tasks.
6.	Communication Skill	<ul style="list-style-type: none"> ➤ To enable the learner to communicate effectively and appropriately in real life situation. ➤ To use English effectively for study purpose across the curriculum. ➤ To develop and integrate the use of four language skills: <ul style="list-style-type: none"> a) Reading b) Writing c) Listening d) Speaking ➤ To revise and reinforce structure already learnt. 	<ul style="list-style-type: none"> ➤ Reading Skills:- Ability to read English with ability to read English with understanding and decipher paragraph patterns, writer techniques and conclusions. ➤ Writing Skills:- Skill to develop the ability to write English correctly and master the mechanics of writing the use of correct punctuation marks and capital letter. ➤ Listening Skills:- Ability to understand English when it is spoken in various contexts. ➤ Speaking Skills:- Develop the ability to speak intelligibly

			using appropriate word stress, sentence stress and elementary intonation patterns.
7.	Bridge Maths	<ul style="list-style-type: none"> ➤ The gap between subjects studied at Pre-university level and subjects they would be studying in Graduation. The syllabus for the course is framed in such a way that they get basic knowledge on the subjects which they would be learning through graduation. 	<ul style="list-style-type: none"> ➤ Helps students to develop a basic concept about mathematics. ➤ It covers basic part of trigonometric, Statics which helps students to relate with the real world.
8.	Environmental Studies	<ul style="list-style-type: none"> ➤ To create awareness about environmental issues. ➤ To nurture the curiosity of students particularly in relation to natural environment. ➤ To develop an attitude among students to actively participate in all the activities regarding environment protection. ➤ To develop skills for identifying and solving environmental problems. 	<ul style="list-style-type: none"> ➤ Critical thinking in relation to environmental affairs. ➤ Understanding about interdisciplinary nature of environmental issues. ➤ Independent research regarding environmental problems in form of project report. ➤ Understand social interactions by which human behave and cultural values that underlay behaviors.
9	Numerical Analysis	<ul style="list-style-type: none"> ➤ To learn how to perform error analysis for arithmetic operations. ➤ To demonstrate working of various numerical methods. ➤ To provide a basic understanding of the derivation and use of methods of interpolation and numerical integration. ➤ To impart knowledge of various statistical techniques. ➤ To develop students' understanding through laboratory activities to solve problems related to above stated concepts. 	<ul style="list-style-type: none"> ➤ Skill to choose and apply appropriate numerical methods to obtain approximate solutions to difficult mathematical problems. ➤ Ability to apply various statistical techniques such as Measures of Central Tendency and Dispersion. ➤ Understanding of relationship between variables using the method of Correlation and Trend Fit Analysis. ➤ Skill to execute programs of various Numerical Methods and Statistical Techniques for solving mathematical problems.
10	Differentiation and Integration	<ul style="list-style-type: none"> ➤ Compute limits, derivatives, and integrals. ➤ Analyze functions using limits, derivatives, and integrals. ➤ Recognize the appropriate tools of calculus to solve applied problems. 	<ul style="list-style-type: none"> ➤ classify partial differential equations and transform into canonical form. ➤ solve linear partial differential equations of both first and second order.

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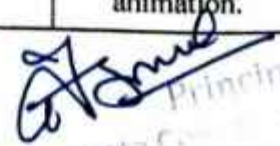
			<ul style="list-style-type: none"> ➤ apply partial derivative equation techniques to predict the behaviour of certain phenomena.
11	Data Structure	<ul style="list-style-type: none"> ➤ To familiarize the students with data structures used for representing data in memory like Arrays, Linked Lists, Graphs, Trees etc. ➤ To analyze the performance of algorithms. ➤ To learn how to apply algorithms of data structures on data. ➤ To gain knowledge of various methods used in data structures such as brute force, divide and conquer, greedy, etc. 	<ul style="list-style-type: none"> ➤ Skill to analyze algorithms and to determine algorithm correctness and their time efficiency. ➤ Knowledge of advanced abstract data type (ADT) and data structures and their implementations. ➤ Ability to implement algorithms to perform various operations on data structures
12	DBMS	<ul style="list-style-type: none"> ➤ To introduce the students to the database system. ➤ To learn how to design a database by using different models. ➤ To enable the students to understand the database handling during execution of the transactions. ➤ To understand the handling of database by concurrent users. ➤ To gain complete knowledge of SQL and PL/SQL. 	<ul style="list-style-type: none"> ➤ Familiarization with Database Management System. ➤ Comprehensive knowledge of database models. ➤ Ability to code database transactions using SQL. ➤ Skill to write PL/SQL programs.
13	Programming in C++ and VC++	<ul style="list-style-type: none"> ➤ To give an overview of benefits of Object Oriented Programming (OOP) approach over the Traditional Programming approach. ➤ To deliver comprehensive view of OOP concept. ➤ To impart detailed knowledge of a powerful object oriented programming language – C++. 	<ul style="list-style-type: none"> ➤ Familiarization with a widely used programming concept – Object Oriented Programming. ➤ Develop logical thinking. ➤ Skill to write codes in C++ by applying concept of OOP, such as Objects, Classes, Constructors, Inheritance etc., to solve mathematical or real world problems . ➤ Ability to isolate and fix common errors in C++ programs.
14	Computer Network & Internet Technology	<ul style="list-style-type: none"> ➤ To deliver comprehensive view of Computer Network. ➤ To enable the students to 	<ul style="list-style-type: none"> ➤ Knowledge of uses and services of Computer Network. ➤ Ability to identify types and

		<p>understand the Network Architecture, Network type and topologies.</p> <ul style="list-style-type: none"> ➤ To understand the design issues and working of each layer of OSI model. ➤ To familiarize with the benefits and issues regarding Network Security. 	<p>topologies of network.</p> <ul style="list-style-type: none"> ➤ Understanding of analog and digital transmission of data. ➤ Familiarization with the techniques of Network Security.
15	Shell Programming in Unix/Linux	<ul style="list-style-type: none"> ➤ To make students understand the features of Linux operating system ➤ To make students learn the components of Linux ➤ To learn basic Linux commands and printing Linux documents. 	<ul style="list-style-type: none"> ➤ Identify the basic Unix general purpose commands. ➤ Apply and change the ownership and file permissions using advance Unix commands. ➤ Use the awk, grep, perl scripts. ➤ Implement shell scripts and sed. ➤ Apply basic of administrative task. 6. Apply networking Unix commands
16	Principal of Management	<ul style="list-style-type: none"> ➤ To acquaint the students with the basic Business Management concept & process. 	<ul style="list-style-type: none"> ➤ Discuss and communicate the management evolution and how it will affect future managers. ➤ Observe and evaluate the influence of historical forces on the current practice of management. ➤ Identify and evaluate social responsibility and ethical issues involved in business situations and logically articulate own position on such issues. ➤ Explain how organizations adapt to an uncertain environment and identify techniques managers use to influence and control the internal environment. ➤ Practice the process of management's four functions: planning, organizing, leading, and controlling.
17	Foundation Course	<ul style="list-style-type: none"> ➤ To impart the basic communication skills among students. ➤ To improve the English Language 	<ul style="list-style-type: none"> ➤ Reading Skills:- Ability to read English with ability to read English with understanding and decipher paragraph patterns, write techniques and

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		<p>Proficiency of the Students.</p> <ul style="list-style-type: none"> ➤ To develop confidence in Speaking English. ➤ To practically train students in using various modes of communication 	<p>conclusions.</p> <ul style="list-style-type: none"> ➤ Writing Skills:- Skill to develop the ability to write English correctly and master the mechanics of writing the use of correct punctuation marks and capital letter. ➤ Listening Skills:- Ability to understand English when it is spoken in various contexts. ➤ Speaking Skills:- Develop the ability to speak intelligibly using
18	Calculus & Geometry	<ul style="list-style-type: none"> ➤ Evaluate the limit of a function using numerical and algebraic techniques, the properties of limits, and analysis techniques. ➤ Evaluate one-sided and two-sided limits for algebraic and trigonometric functions. ➤ Determine analytically whether a limit fails to exist. ➤ Determine whether a function is continuous or discontinuous at a point. 	<ul style="list-style-type: none"> ➤ Students completing this course will be able to find one-sided and two-sided limits. ➤ Students completing this course will be able to apply differentiation techniques to graphing, optimization or related rates problems. ➤ Students completing this course will be able to apply integration techniques to finding area.
19	Differential Equation & Fourier Series	<ul style="list-style-type: none"> ➤ first order linear and nonlinear differential equations and their solutions, trajectories and its types, Lagrange's equation, Clairaut's equation of ,envelopes. ➤ simultaneous linear differential equations with constant coefficients, second order linear differential equations with variable coefficients, series solution. Bessel's and Legendre's equations 	<ul style="list-style-type: none"> ➤ Identify, analyse and subsequently solve physical situations whose behaviour can be described by ordinary differential equations. ➤ solve the problems choosing the most suitable method.
20	Computer System Architecture	<ul style="list-style-type: none"> ➤ To enable the students to understand the functionality and implementation of computer system. ➤ To familiarize with the various instruction codes and formats of different CPUs. ➤ To introduce the students to I/O and memory organization of computer system. ➤ To deliver an overview of Control 	<ul style="list-style-type: none"> ➤ Ability to understand the functionality, organization and implementation of computer system. ➤ Skill to recognize the instruction codes and formats. ➤ Knowledge of the internal working of main memory, cache memory, associative memory and various modes of data transfer.

		<p>Unit of a computer system.</p> <ul style="list-style-type: none"> ➤ To learn the usage of parallel and vector processing. 	<ul style="list-style-type: none"> ➤ Familiarization with the working of parallel processing and vector processing.
21	Java	<ul style="list-style-type: none"> ➤ To learn the syntax and semantics to write Java programs. ➤ To understand the fundamentals of object-oriented programming in Java. ➤ To familiarize with the concept of inheritance, polymorphism, packages and interfaces. 	<ul style="list-style-type: none"> ➤ Skill to write Java application programs using OOP principles and proper program structuring. ➤ Ability to create packages and interfaces. ➤ Ability to implement error handling techniques using exception handling.
22	Operating System	<ul style="list-style-type: none"> ➤ To deliver a detailed knowledge of integral software in a computer system – Operating System. ➤ To understand the working of operating system as a resource manager. ➤ To familiarize the students with Process and Memory management. ➤ To describe the problem of process synchronization and its solution. 	<ul style="list-style-type: none"> ➤ Ability to apply CPU scheduling algorithms to manage tasks. ➤ Initiation into the process of applying memory management methods and allocation policies. ➤ Knowledge of methods of prevention and recovery from a system deadlock.
23	Software Engineering	<ul style="list-style-type: none"> ➤ To introduce the students to a branch of study associated with the development of a software product. ➤ To gain basic knowledge about the pre-requisites for planning a software project. ➤ To learn how to design of software. ➤ To enable the students to perform testing of a software. 	<ul style="list-style-type: none"> ➤ Familiarization with the concept of software engineering and its relevance. ➤ Understanding of various methods or models for developing a software product. ➤ Ability to analyze existing system to gather requirements for proposed system. ➤ Skill to design and code a software.
24	Multimedia Tools and Application	<ul style="list-style-type: none"> ➤ To prepare students to acquire the required skills to create animations and graphics, this can be helpful in building commercial websites. 	<ul style="list-style-type: none"> ➤ Create an ad that uses animation ➤ Draw a hierarchy of information (flow chart) to show an interactive site. ➤ Import graphics and textures created on other applications into a multimedia software program ➤ Create a movie using simple animation.


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			<ul style="list-style-type: none"> ➤ Create a web banner . ➤ Create an effective interactive site for use on the internet
25	Financial Management & Accountancy	<ul style="list-style-type: none"> ➤ To Understand Accounting Standards. ➤ To Understand The Formation Of Public Limited Company Having Share Capital. ➤ To develop various types of Financial Statements. ➤ To Understand the Cost Estimation and Costing Process. 	<ul style="list-style-type: none"> ➤ define bookkeeping and accounting ➤ explain the general purposes and functions of accounting ➤ explain the differences between management and financial accounting ➤ describe the main elements of financial accounting information – assets, liabilities, revenue and expenses ➤ identify the main financial statements and their purposes.
26	Foundation Course	<ul style="list-style-type: none"> ➤ To enable the learner to communicate effectively and appropriately in real life situation. ➤ To use English effectively for study purpose across the curriculum. ➤ To develop and integrate the use of four language skills: <ul style="list-style-type: none"> a) Reading b) Writing c) Listening d) Speaking ➤ To revise and reinforce structure already learnt. 	<ul style="list-style-type: none"> ➤ Reading Skills:- Ability to read English with ability to read English with understanding and decipher paragraph patterns, writer techniques and conclusions. ➤ Writing Skills:- Skill to develop the ability to write English correctly and master the mechanics of writing the use of correct punctuation marks and capital letter. ➤ Listening Skills:- Ability to understand English when it is spoken in various contexts. ➤ Speaking Skills:- Develop the ability to speak intelligibly using
27	Project Work	<ul style="list-style-type: none"> ➤ To learn languages to code front end and back end of a software. ➤ To initiate into the process of designing, coding and testing a software module. ➤ To develop a complete software module. 	<ul style="list-style-type: none"> ➤ Skill to apply Software Development Cycle to develop a software module. ➤ Ability to use the techniques, skills and modern engineering tools necessary for software development. ➤ Develop a software product along with its complete documentation.


➤ Search your personal computer for the various hardware components it contains.

used in micro-computers by operating system, without the use of electronic circuitry.

➤ To introduce the use of operating systems architecture with IBM-PC & clones, excluding Assembly language, with forms an important part of hardware.

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		<ul style="list-style-type: none"> ➤ Given the unit cell for some crystal structure, be able to draw the atomic packing arrangement for a specific crystallographic plane. 	
21	Relativity, Quantum Mechanics, Atomic Molecular	<ul style="list-style-type: none"> ➤ To study the basic principles of quantum mechanics. ➤ Explain the operator formulation of quantum mechanics. ➤ Student learn the concept of wave function. ➤ Student will learn Schrodinger equation and their applications. ➤ To study role of uncertainty in quantum physics. 	<ul style="list-style-type: none"> ➤ Pinpoint the historical aspects of development of quantum mechanics. ➤ Understand and explain the differences between classical and quantum mechanics. ➤ Understand the idea of wave function. ➤ Understand the uncertainty relations. ➤ Solve Schrodinger equation for simple potentials.
22	Computer Software	<ul style="list-style-type: none"> ➤ To introduce Data Base Management System concepts. ➤ To introduce the Relational Database Management System and Relational Database Design. ➤ To introduce the RDBMS software and utility of query language. ➤ To introduce basic concept of GUI Programming and database connectivity using Visual Basic 	<ul style="list-style-type: none"> ➤ Familiarization with Database Management System. ➤ Comprehensive knowledge of database models. ➤ Ability to code database transactions using SQL. ➤ Skill to write PL/SQL programs
23	Computer Hardware	<ul style="list-style-type: none"> ➤ Indicate the names and functions of hardware ports and the parts of the motherboard. ➤ Identify the names and distinguishing features of different kinds of input and output devices. ➤ Describe how the CPU processes data and instructions and controls the operation of all other devices. ➤ Identify the names, distinguishing features, and units for measuring different kinds of memory and storage devices. 	<ul style="list-style-type: none"> ➤ To introduce the overall organisation of the microcomputers and operating systems. ➤ To introduce the interaction of common devices used with computers with operating softwares, excluding the Assembly languages, with special reference to DOS/WINDOWS. ➤ To introduce the working of hardware components, Micro-Processor and various chips


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