DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS

B.A.M. Khalsa College is the best college in Kandi area of Garhshankar, established in 1969 caters to the growing demand for qualified technical personnel in different streams. Since its inception, the college has always been at the forefront of innovation and has attained a leading position in the field of technical and professional education. It has been recommended by many previously passed students and is considered as the best degree college in Garhshankar. It is poised to grow bigger and better as well as continues to seek solutions on important global problems, educating leaders to make the world a better place.

In view of the increasing importance of the computer science discipline, a separate **Department of Computer Science and Applications** was established in 1999 to offer Bachelor degree in Computer Science and Applications and Post- Graduate diploma in computer applications. It enables you to work in multidisciplinary environments and get responsive to the changing needs of the society. Incorporating a detailed mix of software and hardware engineering, this program can be defined as the application of a systemic, disciplined, and quantifiable approach to development, operation and maintenance of computer-related technicalities.

 The Department is well equipped with high end computers, latest software & state-of-the-art IT infrastructure and all these computing resources are inter-connected with high speed intranet. Our students are exposed to up-to-date curriculum, technology and techniques. The Department has well experienced & dedicated faculty members with different specializations

Computer Science and Applications are in great demand in industries across the globe. The program imparts comprehensive knowledge with equal emphasis on theory and practice in the field of computer science. **BCA** and **PGDCA** would be able to demonstrate advanced skills in the effective analysis, design and realization of business systems utilizing contemporary information technology. The broad objective of the program is to provide sound academic base from which an advanced career in Computer Applications can be developed. Conceptual grounding in computer usage as well as its practical business application will be provided making candidates suitable for IT sector entry-level jobs.

VISION

Enabling graduates and post -graduates to be technologically skilled, innovative, self-motivated and responsible citizens, to possess human values and to make a significant contribution to being a center of excellence in providing a globally standardized education through a supportive teaching and research environment that responds quickly to the challenges of the dynamic world.

MISSION

- Have the human, financial, and infrastructure resources needed to achieve our scholarly objectives
- To impart moral and ethical values, and interpersonal skills to the students
- The Department of computer science prepares the students for further study and success in their future career pursuits at the graduate level/or a career in industry
- To provide graduate and post graduates education to prepare students to become thoughtful, productive members of the profession and community of computing

OBJECTIVES

- Modernize and reinforce undergraduate and Post-graduate programs by updating and expanding instructional labs
- Increase the number of working partnerships with other departments and institutes on campus
- Resources and Infrastructure − Maintain a quality workforce and work environment and maximize the use of technology in the delivery of services
- Construct community group associations that upgrade the personal satisfaction for students and the local area
- Significant level and high quality studies, as per national guidelines
- Application-oriented courses, with specific accentuation on lab driven instruction, just as the detailing of a phenomenal logical and designing profile, accomplished through the development of curious and inventive reasoning and the assimilation of essential education standards

Programme run by department:

1. Bachelor of Computer Applications(Programme code: BCA)
2. Post-Graduate Diploma in Computer Applications   (Programme code: PGDCA)

<u>Bachelor in Computer Applications (BCA)</u>

Introduction to BCA course

Bachelor of Computer Science Applications (BCA) is an undergraduate degree course in applications. As the IT industry in India is rising rapidly, the demand for computer professionals is increasing day by day. For computer graduates, the growth of the IT industry has created a lot of opportunities.

One of the famous courses amongst students who want to make their career in the field of IT (Information Technology). The course duration is 3 years and is split into 6 semesters. It addresses topics such as databases, networking, data structure, main programming languages such as 'C' and 'Java','C++','PHP'. This course offers a lot of opportunities for students who are interested in the field of computer science & app and want to work as a software, Database developer in the IT industry.

Learning outcome-based approach to curricular planning

Nature & extent of BCA course

- For students wishing to delve into the world of Programming language. Bachelor's in Computer Science Applications (BCA) is a three-year undergraduate course. One of the most popular options for starting a career in Information Technology is the BCA course.
- This degree will help to the students a sound academic base for an advanced career in Computer Science Applications for the BCA aspirant.
- The programming is designed to incorporate social needs and teaching practices into a way that is responsive to the community's needs.
- BCAprogramme is designed for learning in group and individual learning in the classroom.

Objective of BCA course

- The BCA degree prepares students for the IT/Software industry's staffing and human resources requirements. Students entering the college's BCA department come from a number of backgrounds. Orientation classes are conducted to make students feel at ease with the content of the degree program and to build relationships with their classmates in order to allow them to become acquainted with the course.
- This program is useful for learners to understand, extend and implement the program In their academic advancement, subject awareness.
- The primary purpose of this curriculum is to provide a framework for the efficient use/management of information systems and enterprise software for computing concepts and business practices. It lets students evaluate system creation specifications and introduces students to enterprise applications and information systems.
- This course offers students the possibility to specialize in software for legacy applications, system software or mobile applications.

Programme learning outcomes of BCA (POs)

PO 1	Disciplinary Knowledge	LOCF based curriculum three years degree B.C.A. course helps students to develop in depth knowledge of the areas like such as networking, web programming, IT, Database Management System, computer Graphics.
PO 2	Communication Skills	Communication skills are essential for professional success. It allows people, organizations, and companies to turn a message with a better result with better articulation abilities in Verbal and Non-Verbal Communication
PO 3	Critical Thinking	The B.C.A. programme graduates would be able to build the skills and attitudes needed to think critically, which will engage the min a systematic problem-solving technique. Critical thinking skills can aid you greatly throughout the research process, and as an employee in general. Critical thinking refers to your data analysis skills. When you're in the throes of research, you need to be able to analyze your results and make logical decisions about your findings.

PO 4	**Problem Solving**	Emphasis of this course is to act as an introduction to the thinking world of computers, to help students develop the logic, ability to solve the problems efficiently
PO 5	**Analytical Reasoning**	The programme will help the students to develop analytical ability to solve a problem in logical way to determine a solution
PO 6	**Research Related Skills**	B.C.A. programme encourages students to gain proper skills required in computer science &Applications. Use research findings to advance education theory and practitioners seem likely to be more effective in choosing meaningful problems, forming successful research plans, and in testing hypotheses.
PO 7	**Teamwork & Time Mgt.**	Teamwork based projects challenge the student to apply the technical knowledge they gain in college to solve meaningful and complex problems. Time management in this context includes not just the amount of time required per item, but also the relationship between all items.
PO 8	**Lifelong Learning**	The programme can enhance our understanding, competitiveness and learning new skills of the world around us.
PO 9	**Multicultural Competence**	Relationship building is central to cultural maturity and is focused on the comprehension of each other's values and behaviors and, consequently, on building on the power of each other's awareness, using a diverse range of community members and tools to draw on their understandings
PO 10	**Information/Digital Literacy**	Capacity to use ICT in a variety of learning circumstances, demonstrate the ability to view, analyze and use a range of specific sources of information, And use the necessary data Processing tools.
PO 11	**Environment and Sustainability**	Understand the social, professional, cultural, inequality, diversity and ethical issues involved in the development of software systems
PO 12	**Innovation and Entrepreneurship**	Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large

Qualification Descriptors:

The Qualification Descriptors for the BCA pass course program has five learning features such as topic interpreting, comprehension, communication, examination &application of subject information. This includes the students' knowledge of their culture, group & community and nation. The learning outcomes that a student should be able to demonstrate on completion of a BCA programme includes the following:

a. Demonstrate a fundamental and coherent understanding of the field of Computer Science and Applications. This would also include the students ability to Understand the fundamental concepts of Computers, IT Applications in Business and Database concepts.

b. Demonstrate the ability to understanding & evaluating technical data effectively in order to drawactionable conclusions, including technological methods for the company understanding & evaluating technical data effectively in order to draw actionable conclusions, including technological methods for the company.

c. Meet one's own learning needs, drawing on a variety of current work and technical materials in software development.

d. Communicate the academic aspects of the students correctly in a number of different contexts in a computer science field using the key skills, structures and techniques of the subject.

e. Recognize the scope of BCA graduates depending on the skills that learn during course, have a good variety of jobs as a Web Developer, Network Administrator, System Manager, Computer Programmer, Software Developer, Software Tester, etc.

Programme Specific Outcomes (PSOs)

PSO1	Explore technical knowledge in a variety of fields of Computer Applications and learn in an environment that encourages the development of skills for a successful job and further education.
PSO2	Understand, investigate, and develop computer programmes in related areas like as Algorithms, System Software, Multimedia, Web Design, and Data Analytics for the

		efficient design of computer-based systems of varying complexity.
PSO3		An Ability to comprehend software system structure and development processes.
PSO4		Familiarity and practical competence with a broad range of programming language and open-source platforms.
PSO5		Students will be able to understand a variety of challenges as well as current technological developments, allowing them to come up with fresh ideas and solutions to existing problems.

Course Outcomes of BCA(COs)

Sem.	Course Name	College Code	Course Outcome	
Sem.-I	**English Compulsory-A**	**BCA 101**	**CO1**	To familiarize learners with the introductory knowledge of English language.
			CO2	To enable learner's different genres of literature: prose, poetry and stories. After going through some examples of each, students will demonstrate their knowledge by filling out bubble maps.
			CO3	To enable learners to write analytically in a variety of formats, including essay, letters and translation.
			CO4	To write and distinguish different types of paragraph and letters.
			CO5	To use specific format of use of textual words and idioms in sentence.
			CO6	To analysis the skill of translation from Hindi/ Punjabi to English
Sem.-I	**Fundamentals of Mathematical Statistics**	**BCA 102**	**CO1**	Study basics of statistics, collection and organization of data, graphs of grouped frequency distribution, tabulation of data.
			CO2	Students will be able to calculate averages i.e., arithmetic mean, geometric mean and harmonic mean and discuss their applications
			CO3	Calculate positional values, mode, and range of given

					data
				CO4	Estimate mean deviation, standard deviation, variance of given data.
				CO 5	Analyze correlation, techniques for measuring correlation, Karl Pearson's coefficient, rank coefficients.
				CO 6	Analyze the regression model with hypothesis tests and interprets the results.
Sem.-I	**Computer Fundamentals and Computing Software**	**BCA 103**	CO1	Define basic computer hardware architecture
			CO2	Discuss software applications
			CO3	Use essential IT support skills including installing, configuring, securing, and troubleshooting operating systems and hardware
			CO4	Understand file management
			CO5	Able to aware of RAM, ROM, COST, SIZE, CACHE'S and virtual memory
			CO6	Accomplish creating basic documents, presentations with their properties
Sem.-I	**Problem Solving Through C**	**BCA 104**	CO1	To Define the problem
			CO2	To Extend skill on problem solving by constructing algorithms
			CO3	To Use the fundamentals of C programming in trivial problem solving
			CO4	To Identify solution to a problem and apply control structures and user defined functions for solving the problem.
			CO5	To Demonstrate the use of Strings and string handling functions,structure,union
			CO6	Apply skill of identifying appropriate programming constructs for problem Solving.
Sem.-I	**Lab based on Computer Fundamentals and Computing S/W**	**BCA 105**	CO1	Identify categories of programs, system software and applications
			CO2	Describe the usage of computers and why computers are essential components in business and society.
			CO3	Gainhands-on experience of working in Microsoft products such as: MS Word, MS Excel, and MS Power point.
			CO4	Organize and work with files and folders.
			CO5	Utilize the Internet Web resources.
			CO6	Solve common business problems using appropriate

				Information Technology applications and systems.
Sem.-I	**Lab based on Problem Solving Through C**	**BCA 106**	**CO1**	To Acquire logical thinking.
			CO2	To Identify the correct and efficient ways of solving problems
			CO3	To Define the algorithms and analyze their complexity
			CO4	To Write the C code for a given algorithm
			CO5	To Implement Programs with pointers and arrays, structure, and file input output
			CO6	To Apply skill of identifying appropriate programming constructs for problem solving.
Sem.-II	**English Compulsory-B**	**BCA 201**	**CO1**	To familiarize learners with the introductory knowledge of English language.
			CO2	To enable learner's different genres of literature, prose, poetry and stories. After going through some examples of each, students will demonstrate their knowledge by filling out bubble maps.
			CO3	To analysis the skill of translation from Hindi/Punjabi to English.
			CO4	To critically appreciate literary texts.
			CO5	To master the skill of transformation of all types of sentences.
			CO6	To write paragraph.
Sem.-II	**Computer Organization**	**BCA 202**	**CO1**	Describe the fundamental organization and Architecture of computer system.
			CO2	Learn about representation of Information through number systems like Binary, Decimal, Hexadecimal, Octal Conversions.
			CO3	To Get Knowledge about Basic Building Blocks, Micro instructions Microprocessor Assembly Language and System Maintenance.
			CO4	Express their knowledge in various error correction and detection techniques
			CO5	Distinguish the organization of various parts of a system memory hierarchy.
			CO6	To identify the elements of modern instruction sets and their impact on processor design.

Sem.-II	Fundamentals of Web Programming	BCA 203	CO1	Analyze a web page and identify its elements and attributes.
			CO2	Create web pages using HTML and Cascading Styles sheets
			CO3	Build dynamic web pages using JavaScript(client-side programming).
			CO4	Understand basic JavaScript syntax for variable use, and standard language constructs, such as conditionals and loops.
			CO5	Understand the basic of Dreamweaver for creating website, adding links, lists images.
			CO6	To gain knowledge about web hosting: domain names.
Sem.-II	Object Oriented Programming using C++	BCA 204	CO1	To Understand how C++ improves C with Object Oriented features.
			CO2	To Describe the procedural and object-oriented paradigm with concepts of data, objects, classes, functions and streams.
			CO3	To Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
			CO4	To create different data structures and create /manipulate basic data files and developing applications for real world problems.
			CO5	To apply the concepts in object-oriented programming in terms of software reuse and managing complexity to solve real world problems.
			CO6	To be able to program using C++ features such as composition of objects, operator overloading, inheritance, polymorphism etc.
Sem.-II	Lab based on Fundamentals of Web-Programming	BCA 205	CO1	Understand the fundamentals of web.
			CO2	Develop basic Web Pages.
			CO3	Use different styles to the webpage elements
			CO4	Create dynamic, Interactive Web Pages using JavaScript & Dreamweaver.
			CO5	Use JavaScript to validate form entries.
			CO6	Minor Project
Sem.-II	Lab based on	BCA 206	CO1	To learn the fundamental programming concepts and

	Object Oriented Programming Using C++			methodologies which are essential to building good C/C++ programs.
			CO2	To describe and use software tools in the programing process.
			CO3	To code, document, test and implement a well-structured , robust computer program using the C/C++ programming language.
			CO4	To write reusable modules (collection of functions)
			CO5	To practice the fundamental programming methodologies in the lab experience.
			CO6	To apply good programming principles to the design and implementation of C/C++ programs.
Sem.-III	Punjabi Compulsory -A	BCA 301	CO1	Modern Punjabi Poetry: KavAdhayan.
			CO2	Main Objective of Modern Punjabi poetry to increase the knowledge.
			CO3	Introductory Regarding to Punjabi Short-Story
			CO4	To Make interest in Students Read & Write to Punjabi Short Story
			CO5	To Provide knowledge of Punjabi Writer
			CO6	Incorrect to Correct Word-Formation.
Sem.-III	History & Culture of Punjab -A	BCA 302	CO1	Describe extent, town planning and socio - economic life Punjab during Harappan Civilization.
			CO2	Analyze life of people of Punjab in Vedic and Post Vedic Age.
			CO3	Describe Society and Culture of Punjab during Maurya's and Guptas.
			CO4	Explain the origin and features of Bhakti and Sufi movement in Punjab
			CO5	Describe the teachings of Sikh gurus and development of Sikh Religion.
			CO6	Evaluate the changes in society and culture of Punjab and during rule of Maharaja Ranjit Singh.
Sem.-III	Software Project	BCA 303	CO1	To Acquire strong fundamental knowledge in science, mathematics, fundamentals of computer

	Management			science, software engineering and multidisciplinary engineering to begin in practice as a software engineer.
			CO2	To Describe the principles, concepts & practice of System Analyst & design process
			CO3	To Explain the processes of constructing the different types of information Systems.
			CO4	To Design & Develop of Information System in real world business environment.
			CO5	To Apply Object Oriented concept to capture a business requirement.
			CO6	Students can apply the knowledge, techniques, and skills in the development of a software product.
Sem.-III	**Operating System Concepts and Linux**	**BCA 304**	CO1	To gain knowledge of common numerical methods and how they are used to obtain approximate solution.
			CO2	To understand various interpolation methods and finite difference concepts.
			CO3	Derive numerical methods for various mathematical operations, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations.
			CO4	To understand various methods of Interpolation & Numerical Integration: Forward, Backward, Divided difference, Simpson's Rule.
			CO5	To study various methods of Differential Equations: Euler's Method, RungaKutta Method.
			CO6	To Implement numerical methods in C-language.
Sem.-III	**Database Management System**	**BCA 305**	CO1	To gain knowledge of different concepts of Data Structure.
			CO2	To study the basics concepts of arrays and Stacks.
			CO3	To understand how to represent linked list in memory.
			CO4	To study the representation of Trees and Graphs.
			CO5	To study the basics of Searching.

			CO6	To understand the basics of Sorting.
Sem.-III	**Lab based on Operating System Concepts and Linux**	**BCA 306**	**CO1**	To understand with calculation and interpretation of errors in numerical methods using C language.
			CO2	To study solution of non-linear equations using Iterative methods.
			CO3	To implement simultaneous linear equations using direct & iterative methods.
			CO4	Familiar with numerical Interpolation methods.
			CO5	To understand numerical integration methods.
			CO6	To implement numerical solution of ordinary differential equations.
Sem.-III	**Lab based on Database Management System**	**BCA 307**	**CO1**	To understand how to implement the program in Data Structure.
			CO2	To study the different concepts like array, linked using programming.
			CO3	To understand the different functions of Queue and stack using different loops of C.
			CO4	To understand the concepts of Algorithm.
			CO5	To implement the programs with help of Trees and Graphs.
			CO6	To implement the programs with help of Sorting and Searching.
Sem.-IV	**Punjabi Compulsory -B**	**BCA401**	**CO1**	KavAdhyan of Modern punjabi poetry
			CO2	Main Objective of Modern Punjabi Poetry to increase the knowledge
			CO3	Explanation And Central Ideas of Modern Punjabi Poetry
			CO4	Selected Punjabi Short -Story the Adhayan.
			CO5	To provide knowledge of College Advertisement.
			CO6	Basic knowledge of Punjabi Grammar.
Sem.-IV	**History & Culture of Punjab - B**	**BCA402**	**CO1**	Describe the establishment of colonial rule in Punjab.

			CO2	Analyze the growth of Western Education and Agrarian Policy of Britishers in Punjab.
			CO3	Describe the Social -Religious movement in Punjab.
			CO4	Evaluate the development of Press and literature in Punjab.
			CO5	Analyze the role of people of Punjab in Freedom Struggle.
			CO6	Evaluate the social issues in the post-Independence Punjab.
Sem.-IV	**Software Project Management**	**BCA403**	CO1	Learn developing methodology of software project
			CO2	Understand tools and techniques of Software Project Management
			CO3	Assume the roles and responsibilities associated with managerial functions
			CO4	Compare various approaches in management for problem solving
			CO5	Identify the key contributors and their contributions in the development of management thought.
			CO6	Maintain the quality of software project.
Sem.-IV	**Operating System Concepts and Linux**	**BCA404**	CO1	To make aware of different types of Operating System and their services.
			CO2	Differentiate between programs, processes, and threads.
			CO3	To learn different process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.
			CO4	Experiment an algorithm to detect and avoid deadlock.
			CO5	To know virtual memory concepts.
			CO6	Compare file naming in Linux and Windows.

Sem.-IV	Database Management System	BCA405	CO1	To Define basic function of DBMS
			CO2	To Understand database models & entity relationship models
			CO3	To Design and implement a database schema for a given problem domain
			CO4	To Apply the concept of normalization to reduce the tables and mapping of E-R diagrams to tables
			CO5	To create algebraic queries by using the topic of relational algebra and calculus
			CO6	To Identify the concurrency problems and learn the techniques to handle it
Sem.-IV	Lab based on Operating System Concepts and Linux	BCA406	CO1	Apply the scheduling algorithms for the given problem
			CO2	Demonstrate the fundamental LINUX commands & system calls.
			CO3	Apply the process synchronous concept using message queue, shared memory, semaphore, and Dekker's algorithm for the given situation.
			CO4	Experiment an algorithm to detect and avoid deadlock
			CO5	Demonstrate the various operations of the file system.
			CO6	Apply the various methods in memory allocation and page replacement algorithms.
Sem.-IV	Lab based on Database Management System	BCA407	CO1	To Describe SQL and summarize its basic operators
			CO2	To Show that SQL, although standard and a high-level language, does have some flaws, and that SQL must evolve to include additional features
			CO3	To Illustrate data definition language (DDL) commands for creating tables and views as well as for modifying and dropping tables
			CO4	To Formulate single table SQL queries

			CO5	To Formulate SQL queries that use functions
			CO6	To Show how to establish referential integrity using SQL
Sem.-V	**Computer Networks**	**BCA501**	CO1	To introduce the basic concept of Computer Network
			CO2	To Recognize the different network devices and their functions
			CO3	To Understand and describe the layered protocol model.
			CO4	To Illustrate different link layer terminologies like error detection-correction, Multiple access protocol and Link layer addressing used in network
			CO5	To Design network architecture, assign IP addressing and apply various routing algorithms to find shortest paths for network-layer packet delivery.
			CO6	To Comprehend basic protocols of application layer and how they can be used to assist in network design and implementation
Sem.-V	**Discrete Mathematical Structure**	**BCA502**	CO1	Apply mathematical logic to solve problems.
			CO2	Understand Sets, relations, functions, and discrete structures.
			CO3	Apply the concept of transition table on digraph.
			CO4	Understand the recurrence relation, and able to apply in daily life application
			CO5	Knowledge about automation, and able to solve the questions.
			CO6	Identify algorithms with which to solve mathematical problems.
Sem.-V	**Java Programming**	**BCA503**	CO1	To understand the basic concept of OOPs and JAVA programming language.
			CO2	To Explain the concept of classes and objects with access control to represent real world problems.
			CO3	To demonstrate the implementation of inheritance by using extend and implement keywords.

			CO4	To describe the concept of interface and abstract classes to define generic classes.
			CO5	To implement the user defined exceptions by exception handling keywords (try, catch ,throw, throws and finally).
			CO6	To knowledge on usage of graphical IDE for design and implementation of real time applications in java.
Sem.-V	**Web Application Development Using PHP**	**BCA504**	CO1	Describe the fundamental of Web.
			CO2	Understand basics of the internet.
			CO3	Understand the paradigm for working with form-based data, both from the syntax of HTML forms and access within PHP-based scripts
			CO4	Describe the principles of using MySQL as a backend DBMS with PHP.
			CO5	Analyzing the basic structure of a PHP web application allows you to install and maintain a web server, and compile and run a simple web application.
			CO6	Outline the principles behind using MySQL as a backend DBMS with PHP
Sem.-V	**Lab based on Java Programming**	**BCA505**	CO1	To write JAVA applications programs using OOPs principles and program structuring.
			CO2	To developed java program using packages, inheritance, and interfaces.
			CO3	To create multithreaded programs.
			CO4	To implement error handling techniques using exception handling and develop program using class and inputs from keyboard.
			CO5	To develop graphical User interface using AWT.
			CO6	To Demonstrate event handling mechanism.
Sem.-V	**Lab based on Web Application**	**BCA506**	CO1	An overview of creating static web pages using HTML.

			CO2	Implement the concepts of built-in functions in programming, control structures in programming.
	Development using PHP		CO3	Read, write, and execute PHP programs.
			CO4	Format and validate web pages.
			CO5	Demonstrate the implementation of PHP into current HTML based websites.
			CO6	Develop PHP programs using databases.
Sem.-VI	**E-Commerce**	**BCA601**	CO1	Have knowledge of e-commerce, its components, structure of e-banking, rules, and regulations on e-commerce.
			CO2	Acquire a good knowledge of e-commerce, both the technical and business aspects
			CO3	Understand the principles and practices of e-commerce and its related technologies;
			CO4	Discuss the trends in e-Commerce and the use of the Internet
			CO5	Explain the economic consequences of e-Commerce
			CO6	Understand the processes of developing and implementing e-Commerce applications.
Sem.-VI	**Application Development using VB.NET**	**BCA602**	CO1	To Get knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements, etc.)
			CO2	To Familiar Visual Basic's Integrated Development Environment (IDE)
			CO3	To Write and apply control structures for determining different operations
			CO4	To Create one- and two-dimensional arrays for sorting, calculating, and displaying of data
			CO5	To Write Visual Basic programs using object-oriented programming techniques including classes, objects, methods, instance variables, composition, and inheritance, and polymorphism
			CO6	To Develop Windows applications using forms, controls, and events

Sem.-VI	Computer Graphics and Multimedia Applications	BCA603	CO1	Define the Computer Graphics and its uses.
			CO2	Explain different types of Monitors.
			CO3	Demonstrate the Graphics images on X-Y Coordinate.
			CO4	Analyze the different commands of Auto-Cad
			CO5	Understand about Multimedia and its uses.
			CO6	Explain different functions of Multimedia like Images, Audio, Video and Photoshop
Sem.-VI	Lab based on Computer Graphics and Multimedia Applications	BCA604	CO1	It makes the student confident in designing a Project
			CO2	Students are trained to meet the requirements of the industry.
			CO3	Improvement in analytical and reasoning ability
			CO4	Exposure to a variety of research projects and activities to enrich their academic experience
			CO5	Apply standard coding practices. Develop skills in presentation and discussion of research topics in a public forum.
			CO6	Be aware of the ethical, social, and security issues of information systems.
Sem.-VI	Major Project and Seminar	BCA605	CO1	Implement various shapes in C Programming.
			CO2	Draw the line, rectangle, and square in it.
			CO3	Understand about computer graphics concepts with help of C Programming.
			CO4	Draw the Hut and other shapes in it.
			CO5	Implement various shapes with help of X-Y coordinate.
			CO6	Implement the Ellipse, Circle with the help of C Programming.

Mapping of Course Outcomes(COs) with Programme Outcomes(POs)

							Programme Outcome					
College code	**Course Out- comes**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
						Semester I							
BCA101	**CO1**	1	3	1	1	2	1	2	1	1	1	1	1
	CO2	2	3	1	1	1	1	1	2	2	X	X	1
	CO3	1	3	X	1	1	X	1	2	1	X	X	1
	CO4	1	3	1	1	X	1	2	1	1	1	1	X
	CO5	1	3	1	X	1	1	1	1	X	X	1	1
	CO6	1	3	1	1	1	1	X	1	1	1	1	1
BCA102	**CO1**	X	X	2	1	2	X	X	1	X	X	X	X
	CO2	X	X	2	1	1	X	X	1	X	X	X	X
	CO3	X	X	2	1	2	X	X	X	X	X	X	X
	CO4	X	X	2	1	2	X	X	X	X	X	X	X
	CO5	X	X	2	1	2	X	X	1	X	X	X	X
	CO6	X	X	2	1	2	X	X	1	X	X	X	X
BCA103	**CO1**	X	2	X	X	X	X	X	X	X	X	X	X
	CO2	X	3	1	X	X	X	X	X	X	X	X	X
	CO3	X	2	X	X	X	X	X	X	X	X	X	X
	CO4	X	3	X	X	X	X	X	X	X	X	X	X
	CO5	X	X	X	X	X	X	X	X	X	X	3	X
	CO6	X	X	X	X	X	X	X	X	X	X	X	3
BCA104	**CO1**	X	1	X	X	2	X	X	X	X	X	1	X
	CO2	X	X	1	X	X	1	X	X	X	X	X	1
	CO3	X	X	X	1	X	X	X	1	1	X	2	X
	CO4	2	X	X	X	X	X	1	X	X	X	X	1
	CO5	X	X	X	X	X	2	X	X	X	2	X	X
	CO6	X	X	X	X	1	X	X	2	X	X	X	1

BCA105	**CO1**	3	2	X	X	X	X	X	X	X	X	X	X
	CO2	X	3	1	X	X	X	2	X	X	X	X	X
	CO3	X	1	3	X	X	X	X	X	X	X	X	X
	CO4	X	2	X	X	X	X	X	X	X	X	X	X
	CO5	X	X	X	X	X	X	X	X	X	X	3	X
	CO6	X	X	X	X	X	X	3	X	X	X	X	3
BCA106	**CO1**	2	X	X	1	X	1	X	X	X	X	1	X
	CO2	X	X	X	X	X	X	X	X	X	X	X	X
	CO3	1	1	X	X	3	X	1	X	1	X	X	1
	CO4	X	X	X	1	X	X	X	X	X	X	X	X
	CO5	1	1	X	X	X	X	X	X	X	X	X	1
	CO6	X	X	X	1	X	X	1	X	X	X	X	X
Semester II													
BCA201	**CO1**	1	3	1	1	2	1	2	1	1	1	1	1
	CO2	2	3	1	1	1	1	1	2	2	X	X	1
	CO3	1	3	X	1	1	X	1	2	1	X	X	1
	CO4	1	3	1	1	X	1	2	1	1	1	1	X
	CO5	1	3	1	X	1	1	1	1	X	X	1	1
	CO6	1	3	1	1	1	1	X	1	1	1	1	1
BCA202	**CO1**	2	X	X	1	X	1	X	X	X	X	1	X
	CO2	X	X	X	X	X	X	X	X	X	X	X	X
	CO3	1	1	X	X	3	X	1	X	1	X	X	1
	CO4	X	X	X	1	X	X	X	X	X	X	X	X
	CO5	1	1	X	X	X	X	X	X	X	X	X	1
	CO6	X	X	X	1	X	X	1	X	X	X	X	X
BCA203	**CO1**	1	X	X	X	3	X	X	X	X	X	X	X
	CO2	X	1	X	X	X	X	X	X	X	X	X	X
	CO3	X	X	2	X	X	X	X	X	X	X	2	X
	CO4	X	X	X	X	X	2	X	X	X	X	X	2
	CO5	X	X	X	X	1	X	X	X	X	2	X	X

	CO6	X	X	X	X	X	X	2	X	X	X	X	1
BCA204	CO1	1	1	1	X	X	1	X	2	X	X	X	X
	CO2	X	1	2	1	1	1	X	X	X	1	1	1
	CO3	1	X	1	1	2	1	X	1	1	X	X	2
	CO4	X	X	1	1	X	1	1	X	X	X	X	1
	CO5	X	1	2	2	1	1	1	1	X	X	2	1
	CO6	2	1	X	2	1	2	1	1	X	1	1	3
BCA205	CO1	X	X	2	X	1	X	X	X	X	X	X	X
	CO2	X	X	X	X	X	X	X	X	X	X	X	X
	CO3	X	1	X	X	X	1	X	X	X	X	X	1
	CO4	X	X	X	1	X	X	X	X	1	X	X	X
	CO5	X	X	X	X	X	X	X	X	X	X	X	X
	CO6	X	X	X	X	1	X	X	X	X	2	X	X
BCA206	CO1	2	1	X	X	X	1	X	2	X	X	X	X
	CO2	X	1	2	1	1	1	X	X	X	1	1	1
	CO3	1	X	1	1	2	1	X	1	1	X	X	2
	CO4	X	X	1	1	X	X	1	X	X	X	X	1
	CO5	X	1	2	2	1	1	1	1	X	X	2	1
	CO6	2	1	X	2	1	2	1	1	X	1	1	3
SEMESTER-III													
BCA301	CO1	X	X	X	X	X	X	X	X	X	X	X	X
	CO2	X	X	X	1	X	X	1	X	X	X	X	X
	CO3	X	2	X	X	X	X	X	X	X	X	2	X
	CO4	X	X	X	2	X	X	X	X	X	1	X	X
	CO5	X	X	X	X	X	X	X	X	X	X	X	X
	CO6	X	X	X	X	X	X	X	X	X	X	X	X
BCA302	CO1	X	2	1	X	1	X	X	2	3	X	X	X
	CO2	X	2	1	X	1	X	X	2	3	X	X	X
	CO3	X	2	1	X	1	X	X	2	3	X	X	X

	CO4	X	2	1	X	1	X	X	2	3	X	X	X
	CO5	X	2	1	X	1	X	X	2	3	X	X	X
	CO6	X	2	1	X	1	X	X	2	3	X	X	X
BCA303	CO1	3	1	X	X	X	X	X	X	X	X	X	X
	CO2	2	X	X	X	2	X	2	X	X	X	X	1
	CO3	2	2	2	2	X	X	X	X	X	X	X	X
	CO4	2	1	X	X	X	X	X	X	X	X	X	X
	CO5	2	X	X	X	X	X	X	X	X	X	2	X
	CO6	3	X	X	X	X	X	X	X	X	X	X	3
BCA304	CO1	X	2	1	X	1	X	X	2	3	X	X	X
	CO2	X	2	1	X	1	X	X	2	3	X	X	X
	CO3	X	2	1	X	1	X	X	2	3	X	X	X
	CO4	X	2	1	X	1	X	X	2	3	X	X	X
	CO5	X	2	1	X	1	X	X	2	3	X	X	X
	CO6	X	2	1	X	1	X	X	2	3	X	X	X
BCA305	CO1	X	X	X	X	X	X	X	X	X	X	X	X
	CO2	X	X	1	X	1	X	X	1	X	1	X	X
	CO3	X	X	X	X	X	X	X	X	X	X	X	X
	CO4	X	X	1	X	X	1	1	X	X	X	X	X
	CO5	2	X	1	1	X	X	1	X	X	1	X	X
	CO6	1	X	X	X	X	1	X	X	X	1	1	X
BCA306	CO1	2	X	X	X	X	X	X	1	X	X	X	1
	CO2	X	X	X	X	X	X	X	X	X	X	X	X
	CO3	2	X	X	X	X	X	X	X	X	X	X	X
	CO4	X	X	X	X	X	X	X	X	X	X	X	X
	CO5	X	X	X	X	X	X	X	X	X	X	X	X
	CO6	X	X	X	X	X	X	X	X	X	X	X	2
BCA307	CO1	X	X	X	X	X	X	X	X	X	X	X	X
	CO2	X	X	1	X	1	X	X	1	X	1	X	X

	CO3	X	X	X	X	X	X	X	X	X	X	X	X
	CO4	X	X	1	X	X	1	1	X	X	X	X	X
	CO5	2	X	1	1	X	X	1	X	X	1	X	X
	CO6	1	X	X	X	X	1	X	X	X	1	1	X
SEMESTER-IV													
BCA401	CO1	X	X	X	X	X	X	X	X	X	X	X	X
	CO2	X	X	X	1	X	X	1	X	X	X	X	X
	CO3	X	2	X	X	X	X	X	X	X	X	2	X
	CO4	X	X	X	2	X	X	X	X	X	1	X	X
	CO5	X	X	X	X	X	X	X	X	X	X	X	X
	CO6	X	X	X	X	X	X	X	X	X	X	X	X
BCA402	CO1	X	2	1	X	1	X	X	2	3	X	X	X
	CO2	X	2	1	X	1	X	X	2	3	X	X	X
	CO3	X	2	1	X	1	X	X	2	3	X	X	X
	CO4	X	2	1	X	1	X	X	2	3	X	X	X
	CO5	X	2	1	X	1	X	X	2	3	X	X	X
	CO6	X	2	1	X	1	X	X	2	3	X	X	X
BCA403	CO1	X	X	2	X	X	X	X	1	X	X	X	X
	CO2	X	X	2	2	2	X	X	X	X	X	X	X
	CO3	X	X	X	X	1	X	X	2	X	X	X	X
	CO4	X	X	2	X	2	X	X	X	X	X	X	X
	CO5	X	X	2	X	2	1	X	X	X	X	X	X
	CO6	3	X	X	X	X	X	X	X	X	2	X	2
BCA404	CO1	1	1	X	X	X	X	X	X	X	X	X	X
	CO2	2	X	X	X	2	X	2	X	X	1	X	1
	CO3	2	2	2	2	X	X	X	X	X	X	X	X
	CO4	3	1	X	X	X	X	2	1	X	X	X	1
	CO5	2	X	X	X	X	X	X	X	X	X	2	X
	CO6	2	X	X	X	X	1	X	X	X	X	X	3

BCA405	**CO1**	X	X	2	X	X	X	X	1	X	X	X	X
	CO2	X	X	2	2	2	X	X	X	X	X	X	X
	CO3	X	X	X	X	1	X	X	2	X	X	X	X
	CO4	X	X	2	X	2	X	X	X	X	X	X	X
	CO5	X	X	2	X	2	1	X	X	X	X	X	X
	CO6	3	X	X	X	X	X	X	X	X	2	X	2
BCA406	**CO1**	X	X	2	X	X	X	X	1	X	X	X	X
	CO2	X	X	2	2	2	X	X	X	X	X	X	X
	CO3	X	X	X	X	1	X	X	2	X	X	X	X
	CO4	X	X	2	X	2	X	X	X	X	X	X	X
	CO5	X	X	2	X	2	1	X	X	X	X	X	X
	CO6	3	X	X	X	X	X	X	X	X	2	X	2
BCA407	**CO1**	1	1	X	X	X	X	X	X	X	X	X	X
	CO2	2	X	X	X	2	X	2	X	X	1	X	1
	CO3	2	2	2	2	X	X	X	X	X	X	X	X
	CO4	3	1	X	X	X	X	2	1	X	X	X	1
	CO5	2	X	X	X	X	X	X	X	X	X	2	X
	CO6	2	X	X	X	X	1	X	X	X	X	X	3
SEMESTER-V													
BCA501	**CO1**	1	1	X	X	X	X	X	1	X	X	X	X
	CO2	2	X	X	X	2	X	2	X	X	1	X	1
	CO3	2	X	1	2	X	X	X	X	1	X	X	X
	CO4	1	1	X	X	1	X	2	1	X	X	X	1
	CO5	2	X	X	1	X	X	X	X	X	X	X	X
	CO6	2	X	X	X	X	1	X	X	X	X	X	3
BCA502	**CO1**	1	1	3	3	2	2	1	2	1	1	2	1
	CO2	1	X	2	3	2	3	2	2	3	3	1	X
	CO3	3	2	3	2	3	2	X	2	3	2	1	2
	CO4	2	X	2	2	2	1	X	1	X	1	1	X
	CO5	3	2	3	3	3	3	3	3	3	3	2	2

	CO6	3	X	1	1	2	1	1	X	1	2	1	1
BCA503	**CO1**	1	1	X	X	X	X	X	1	X	X	X	X
	CO2	2	X	X	X	2	X	2	X	X	1	X	1
	CO3	2	X	1	2	X	X	X	X	1	X	X	X
	CO4	1	1	X	X	1	X	2	1	X	X	X	1
	CO5	2	X	X	1	X	X	X	X	X	X	X	X
	CO6	2	X	X	X	X	1	X	X	X	X	X	3
BCA504	**CO1**	1	1	X	X	X	X	X	1	X	X	X	X
	CO2	2	X	X	X	2	X	2	X	X	1	X	1
	CO3	2	X	1	2	X	X	X	X	1	X	X	X
	CO4	1	1	X	X	1	X	2	1	X	X	X	1
	CO5	2	X	X	1	X	X	X	X	X	X	X	X
	CO6	2	X	X	X	X	1	X	X	X	X	X	3
BCA505	**CO1**	1	1	X	X	X	X	X	1	X	X	X	X
	CO2	2	X	X	X	2	X	2	X	X	1	X	1
	CO3	2	X	1	2	X	X	X	X	1	X	X	X
	CO4	1	1	X	X	1	X	2	1	X	X	X	1
	CO5	2	X	X	1	X	X	X	X	X	X	X	X
	CO6	2	X	X	X	X	1	X	X	X	X	X	3
BCA 506	**CO1**	1	1	X	X	X	X	X	1	X	X	X	X
	CO2	2	X	X	X	2	X	2	X	X	1	X	1
	CO3	2	X	1	2	X	X	X	X	1	X	X	X
	CO4	1	1	X	X	1	X	2	1	X	X	X	1
	CO5	2	X	X	1	X	X	X	X	X	X	X	X
	CO6	2	X	X	X	X	1	X	X	X	X	X	3
SEMESTER-VI													
BCA601	**CO1**	3	1	X	X	X	X	X	X	X	X	X	X
	CO2	2	X	X	X	2	X	2	X	X	X	X	1
	CO3	2	2	2	2	X	X	X	X	X	X	X	X
	CO4	2	1	X	X	X	X	X	X	X	X	X	X

College Code	CO												
	CO5	2	X	X	X	X	X	X	X	X	X	2	X
	CO6	3	X	X	X	X	X	X	X	X	X	X	3
BCA602	CO1	1	1	X	X	X	X	X	X	X	X	X	X
	CO2	2	X	X	X	2	X	2	X	X	X	X	X
	CO3	X	X	X	1	X	X	X	X	X	X	X	1
	CO4	1	1	X	X	X	X	X	1	X	X	X	X
	CO5	1	X	X	X	X	X	X	X	X	X	2	X
	CO6	1	X	X	X	X	X	X	X	X	X	X	2
BCA603	CO1	3	X	X	1	1	X	X	X	X	1	X	X
	CO2	2	X	X	X	X	1	X	X	1	2	X	X
	CO3	3	X	X	2	1	1	1	X	X	X	X	X
	CO4	1	1	X	X	X	X	X	X	X	2	X	X
	CO5	2	X	X	X	X	X	X	2	X	2	X	X
	CO6	2	X	X	X	X	X	X	2	X	2	X	X
BCA604	CO1	3	X	X	1	1	X	X	X	X	1	1	X
	CO2	2	X	X	X	1	1	X	X	1	2	X	X
	CO3	3	X	X	2	1	1	1	X	X	X	X	X
	CO4	1	1	X	X	X	X	X	X	X	2	X	X
	CO5	2	X	X	X	X	1	X	2	X	2	X	X
	CO6	2	X	X	X	X	X	X	2	X	2	X	X
BCA605	CO1	2	3	3	X	3	3	2	2	2	2	3	3
	CO2	2	3	3	X	2	X	2	X	X	X	X	1
	CO3	2	2	X	2	X	X	X	X	X	X	X	X
	CO4	3	3	X	X	X	X	X	1	X	X	X	X
	CO5	3	3	3	X	X	X	X	X	X	X	2	X
	CO6	2	3	3	X	X	X	X	X	X	X	X	3

Mapping of Course Outcomes with Programme Specific Outcomes(PSOs)

College Code	Course Outcome	Program Specific Outcome (PSO)				
		PSO 1	PSO2	PSO3	PSO4	PSO5

Semester I							
BCA 101	**CO1**	X	X	X	X	2
	CO2	X	X	X	X	2
	CO3	X	X	X	X	2
	CO4	X	X	X	X	2
	CO5	X	X	X	X	2
	CO6	X	X	X	X	2
BCA 102	**CO1**	1	X	X	X	X
	CO2	1	X	X	X	X
	CO3	1	X	X	X	X
	CO4	1	X	X	X	X
	CO5	1	X	X	X	X
	CO6	1	X	X	X	X
BCA 103	**CO1**	X	3	2	X	X
	CO2	1	3	3	X	X
	CO3	2	3	1	X	X
	CO4	2	3	1	X	X
	CO5	X	3	1	2	2
	CO6	1	3	1	3	2
BCA 104	**CO1**	1	X	1	X	X
	CO2	X	1	X	1	1
	CO3	3	X	3	X	X
	CO4	X	X	X	X	1
	CO5	X	2	X	1	X
	CO6	1	X	X	X	1
BCA 105	**CO1**	3	3	X	X	X
	CO2	2	3	X	X	X
	CO3	2	3	X	X	X
	CO4	2	3	X	X	X
	CO5	2	3	X	2	X
	CO6	2	3	3	2	X
BCA106	**CO1**	X	1	X	1	X
	CO2	1	X	2	X	X
	CO3	X	X	1	X	1
	CO4	X	1	X	1	X
	CO5	1	X	X	X	X

	CO6	X	X	1	1	1
Semester II						
BCA201	CO1	X	X	X	X	2
	CO2	X	X	X	X	2
	CO3	X	X	X	X	2
	CO4	X	X	X	X	2
	CO5	X	X	X	X	2
	CO6	X	X	X	X	2
BCA202	CO1	X	1	X	1	X
	CO2	1	X	2	X	X
	CO3	X	X	1	X	1
	CO4	X	1	X	1	X
	CO5	1	X	X	X	X
	CO6	X	X	1	1	1
BCA203	CO1	1	2	X	X	X
	CO2	1	2	X	2	X
	CO3	1	1	X	2	X
	CO4	1	1	X	X	X
	CO5	1	1	X	2	X
	CO6	3	1	X	X	X
BCA204	CO1	1	2	X	X	1
	CO2	X	1	X	X	1
	CO3	3	2	1	1	1
	CO4	X	1	1	X	2
	CO5	2	1	1	1	X
	CO6	1	1	1	1	2
BCA205	CO1	X	X	2	X	1
	CO2	2	X	X	X	X
	CO3	X	1	X	X	X
	CO4	X	X	X	1	X
	CO5	X	X	X	X	X
	CO6	X	X	1	X	1
BCA206	CO1	2	1	1	X	1
	CO2	1	2	X	X	1
	CO3	3	2	1	1	1
	CO4	X	1	1	X	2

	CO5	2	1	1	1	X
	CO6	X	1	1	2	3
Semester III						
BCA301	CO1	X	X	X	X	X
	CO2	1	X	X	X	X
	CO3	X	X	X	X	X
	CO4	1	X	1	X	X
	CO5	X	X	X	1	X
	CO6	X	X	X	X	X
BCA302	CO1	X	X	X	X	X
	CO2	X	X	X	X	X
	CO3	X	X	X	X	X
	CO4	X	X	X	X	X
	CO5	X	X	X	X	X
	CO6	X	X	X	X	X
BCA303	CO1	1	1	X	2	X
	CO2	X	1	X	X	1
	CO3	X	1	X	X	X
	CO4	X	1	X	X	X
	CO5	X	1	X	X	X
	CO6	X	3	1	2	X
BCA304	CO1	2	3	2	1	1
	CO2	1	1	X	1	1
	CO3	1	2	1	1	1
	CO4	X	X	1	1	1
	CO5	1	2	X	X	X
	CO6	X	1	X	X	X
BCA305	CO1	2	1	X	X	X
	CO2	X	X	X	X	X
	CO3	X	X	1	X	X
	CO4	X	X	X	X	X
	CO5	X	X	X	X	X
	CO6	X	X	X	X	X
BCA306	CO1	2	3	2	1	1

	CO2	1	1	X	1	1
	CO3	1	2	1	1	1
	CO4	X	X	1	1	1
	CO5	1	2	X	X	X
	CO6	X	1	X	X	X
Semester IV						
BCA401	CO1	X	X	X	X	X
	CO2	1	X	X	X	X
	CO3	X	X	X	X	X
	CO4	1	X	1	X	X
	CO5	X	X	X	1	X
	CO6	X	X	X	X	X
BCA402	CO1	X	X	X	X	X
	CO2	X	X	X	X	X
	CO3	X	X	X	X	X
	CO4	X	X	X	X	X
	CO5	X	X	X	X	X
	CO6	X	X	X	X	X
BCA403	CO1	1	1	X	2	X
	CO2	X	1	X	X	1
	CO3	X	1	X	X	X
	CO4	X	1	X	X	X
	CO5	X	1	X	X	X
	CO6	X	3	1	2	X
BCA404	CO1	2	X	X	2	X
	CO2	1	3	X	2	2
	CO3	3	2	X	X	X
	CO4	1	3	X	X	1
	CO5	3	3	2	2	X
	CO6	2	3	1	2	2
BCA405	CO1	1	1	X	2	X
	CO2	X	1	X	X	1
	CO3	X	1	X	X	X
	CO4	X	1	X	X	X

	CO5	X	1	X	X	X
	CO6	X	3	1	2	X
BCA406	CO1	1	X	X	2	X
	CO2	1	2	X	2	2
	CO3	2	2	1	X	X
	CO4	X	X	X	X	1
	CO5	3	2	X	1	X
	CO6	X	1	X	2	2
BCA407	CO1	2	X	X	2	X
	CO2	1	3	X	2	2
	CO3	3	2	X	X	X
	CO4	1	3	X	X	1
	CO5	3	3	2	2	X
	CO6	2	3	1	2	2
Semester IV						
BCA501	CO1	1	X	X	2	X
	CO2	1	2	X	2	2
	CO3	2	2	1	X	X
	CO4	X	X	X	X	1
	CO5	3	2	X	1	X
	CO6	X	1	X	2	2
BCA502	CO1	3	3	2	1	2
	CO2	3	2	2	2	3
	CO3	2	2	1	1	1
	CO4	1	X	1	X	1
	CO5	2	3	1	2	2
	CO6	1	1	1	1	1
BCA503	CO1	1	X	X	2	X
	CO2	1	2	X	2	2
	CO3	2	2	1	X	X
	CO4	X	X	X	X	1
	CO5	3	2	X	1	X
	CO6	X	1	X	2	2
BCA504	CO1	1	X	X	2	X
	CO2	1	2	X	2	2
	CO3	2	2	1	X	X

Course	CO					
	CO4	X	X	X	X	1
	CO5	3	2	X	1	X
	CO6	X	1	X	2	2
BCA505	CO1	1	X	X	2	X
	CO2	1	2	X	2	2
	CO3	2	2	1	X	X
	CO4	X	X	X	X	1
	CO5	3	2	X	1	X
	CO6	X	1	X	2	2
BCA506	CO1	1	X	X	2	X
	CO2	1	2	X	2	2
	CO3	2	2	1	X	X
	CO4	X	X	X	X	1
	CO5	3	2	X	1	X
	CO6	X	1	X	2	2
Semester VI						
BCA601	CO1	3	2	X	2	X
	CO2	3	3	X	1	2
	CO3	2	2	X	X	X
	CO4	2	3	1	X	X
	CO5	2	3	2	2	X
	CO6	2	3	3	2	2
BCA602	CO1	X	X	X	2	X
	CO2	X	1	X	1	2
	CO3	1	1	X	X	X
	CO4	X	X	1	X	X
	CO5	X	X	X	1	X
	CO6	X	X	1	X	2
BCA603	CO1	3	3	2	X	X
	CO2	X	X	X	X	X
	CO3	1	2	X	X	X
	CO4	X	X	X	X	1
	CO5	X	3	1	X	X
	CO6	1	3	1	2	1
BCA604	CO1	3	3	2	X	X
	CO2	X	X	X	X	X

	CO3	1	2	X	X	X
	CO4	X	X	X	X	1
	CO5	X	3	1	X	X
	CO6	1	3	1	2	1
BCA605	CO1	X	X	X	2	X
	CO2	X	3	2	X	2
	CO3	1	2	X	X	X
	CO4	1	3	X	X	2
	CO5	2	3	X	2	X
	CO6	2	3	3	2	1

Post Graduate Diploma in Computer Application (PGDCA)

Preamble

Postgraduate Diploma in Computer Applications (PGDCA) at B.A.M KhalsaCollege ,Garhshankar is intended primarily to concentrate in the stream of students who want   to have a wide range of IT skills and pursue their career in computers.

Introduction to PGDCA course

The PG Diploma is a Post Graduate Diploma course. The duration of the course is 1   year, which includes 2 semesters. Any graduate who appears in any discipline (Science, Commerce, Arts& Engineering) for the final year degree examination is qualified to apply. In-depth and detailed knowledge of computer applications is demonstrated in the PGDCA course.

Learning outcome based approach to curricular planning

Nature & extent of PGDCA Course

Graduates from different disciplines are the essence of the potential target community of learners Such asArts,Science,Commerce,Computer Science and other graduate students. It also includes students who want to learn, Entrepreneurs, such as web designers, developers, etc.

Objective of PGDCA Course

- Training students in the principles of basic computer technology and applications of informationtechnology.
- Growing the learners' knowledge base through various activities that will be in addition to theoretical studies.
- To give students hands-on experience while designing IT applications in real world , such as part of the study
- To introduce students to Open Source Technology so that they are acquainted with it and can pursue relevant trade and business opportunities
- Improving their career prospects in the coding and maintenance of software in the public sector.

Programmeoutcomes of PGDCA (POs)

Postgraduate Attributes:

PO1	Moral and ethical values	Ethical decisions that one makes revolves around the individuals. Personal code, code of conduct in the context of a work place and how exposed one is especially on the code of ethics
PO2	Analytical reasoning	An analytical reasoning test is a way to assess the understanding skills of a candidate and their ability to recognize key data, apply logic and find patterns
PO3	Critical thinking	The P.G.D.C.A. programme encourages students to "thinking about thinking"—identifying, analyzing, and then fixing flaws in the way we think. Making logical and reasoned judgments that are well thought out is at the core of critical thinking
PO4	Research related Skills	The P.G.D.C.A. programme encourages students to find an answer to a question or a solution to a problem is research competence.Research skills include the ability to collect data about your subject, evaluate the data, and analyze and interpret the data in a way that takes us to a

		solution.
PO5	**Communication Skills**	Enhance the ability of writing skills of various types of letters, report and notes Communication skills useful to comprehend the distinctions in how to convey through eye to eye associations, written and computerized correspondences like email and web-based media.
PO6	**Problem Solving**	PC Based Problem Solving Process is a work expected to offer a deliberate treatment to the hypothesis and practice of planning, executing, and utilizing programming apparatuses during the critical thinking measure. The students are able understand how a human solves a problem, then understand how to translate this "algorithm" into something a computer can do, and finally how to "write" the specific syntax (required by a computer) to get the job done.
PO7	**Reflective Thinking**	This Programme teach the students higher-order thinking skills and therefore requires deep thinking and the ability to rationalize every decision made.
PO8	**Team work and Time Management**	The importance of teamwork and time management as a learning outcome for students in computer science and applications is by nature a collaborative process and most production system are designed by teams working over long period of time. Those who employ the post – graduates from these program look for those skills.
PO9	**Enhanced Knowledge**	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.
PO10	**Learning NewTechnology**	To train graduate students in basic computer technology concepts and information technology applications.
PO11	**Learn Trouble Shooting**	Perform various office activities on computer system such as installation of software, handling of printer and scanner, internet connection along with troubleshooting of system.
PO12	**Developing Minor Project**	Develop minor project application based on C/C++ and HTML based languages.

Qualification Descriptors:

The key Qualification Descriptors for PGDCA pass course shall be clarity of rational thinking & logical method as well as the structure. Each computer application student should have the ability to:

- The academic environment and students have gained tremendous attention from the Post Graduate Diploma Program in the fields of Computing and Information Technology. New nomenclatures and emerging fields have also been developed in recent years by the growth of the computing and information technology sectors.

- Communicate the program at the master's level that address only the basics. These services are specifically aimed at providing applicants with technical education and preparation for better job opportunities and business readiness.

- To promote a great sense of ethical & moral responsibility among learners towards the general interest of society & the country, apply subject-specific skills in IT.

- The course is intended to acquire advanced technical understanding those with a bachelor's and master's degree and to improve their interdisciplinary/translation .

- Demonstrate a fundamental duty of individuals to create and implement new software and databases and to maintain and upgrade existing software and databases to enhance performance.

- This qualification has a broad range of scope. Employability ranges from self-employment or contractual employment to education. The applicants will be working in the sectors after successful completion of the qualification.

Programme Specific Outcomes (PSOs)

PSO1	Develop the skills of designing and developing applications in information technology.
PSO2	To train the graduates students in field of information technology.
PSO3	Design and develop applications to analyze the problem.
PSO4	Students will able to learn new applications in the field of computer Science.
PSO5	Students will able to learn different programming languages in computer.

COURSE OUTCOMES(COs) OF PGDCA

Semester	Course Name	College/ Course Code	Course Outcome	
Sem.-I	**Computer Fundamentals**	**PGDCA101**	CO1	Basic Knowledge of input/output devices & various types of memories.
			CO2	Understand binary, hexadecimal and octal systems and their arithmetic.
			CO3	Become proficient in using the features of MS Office.
			CO4	Determine what operating system you have, Create files and folders, organize files and folders, delete and restore files and folders using the Recycle Bin.
			CO5	Understand the basic set of commands and editors in Linux operating system

			CO6	Each student must be able to configure the basic computer management settings of windows components. Each student must be familiar with MS-DOS command prompt and basic DOS commands.
	Computer Programming Using C	**PGDCA102**	**CO1**	Learn how to build by the algorithms for problems
			CO2	Learn how to apply logic for problems.
			CO3	Enhance their programming skills.
			CO4	Learn about Loops, Conditional statements, Array, Pointers, File Handling, Structure, Unions etc.
			CO5	Learn how to create pictorial representations of the program
			CO6	Understand the dynamics of memory by the use of pointers and Structures
	Database Management System	**PGDCA103**	**CO1**	Understand, appreciate and effectively explain the underlying concepts of database Technologies
			CO2	Design and implement a database schema for a given problem-domain
			CO3	Normalize a database and Populate and query a database using SQL DML/DDL commands
			CO4	Declare and enforce integrity constraints on a database
			CO5	Concept of transaction and concurrency
			CO6	Acquire a good understanding of database systems concepts and to be in a position,to use and design databases for different applications
	Data Communications and Networks	**PGDCA104**	**CO1**	Illustrate reference models with layers, protocols and interfaces. & Summarize functionalities of different Layers.
			CO2	Combine and distinguish functionalities of different Layers
			CO3	Describe and Analysis of basic protocols of computer networks, and how they can be used to assist in network design and implementation

			CO4	Identify and describe development history of routing protocols
			CO5	Describe Sub-netting and Addressing
			CO6	Understand design issues in network security and to understand security threats, security services and mechanisms to counter.
Practical s	**Lab (Based on PGD-1101 &1102**	**PGDCA105**	CO1	To learn problem solving techniques.
			CO2	To understand how to write the C code for a given algorithm. Compile and debug programs in Language.
			CO3	Create programs involving decision structures, loops, strings and functions.
			CO4	Demonstrate file handling (text files).
			CO5	Students familiar to work with MS-DOS command prompt and basic DOS commands. Use of various set of commands and editors in Linux operating systems
			CO6	Use systems development, word-processing, spreadsheet, and presentation software to solve basic information systems problems. Create, edit, save, retrieve, working with tables, charts, bullets and print MS Word, Excel, Power-point documents.
	Lab(Based on PGD-1103)	**PGDCA106**	CO1	Define the database and its design.
			CO2	Compute the various SQL queries.
			CO3	Compute DDL,DML and TCL queries.
			CO4	Analyze the different constraints like primary key,foreign key,check,not null,null and unique key.
			CO5	Implement queries of Joins,Arithmetic and logical operators.
			CO6	Implement conditions in queries like Where Clause,Having Clause and OrderBy Clause.
Sem.-II	**Object Oriented**	**PGDCA201**	CO1	To understand the basic concepts of object oriented programming & Java Programming language .

	Concepts Using JAVA		CO2	To Use the syntax and semantics of Java programming language and basic concepts of OOPs.
			CO3	The students will have the competence in the use of Java Programming language.
			CO4	To Explain the concept of classses and objects with access control to represent real world problems.
			CO5	Design and implement an application that demonstrates their competency with Java syntax, structure and programming logic, incorporating basic features of the language as well as some features from the I/O (Input/Output) or GUI libraries.
			CO6	Competence in the use of Java Programming language in the development of small to medium sized application programs
	Web Technologies	PGDCA202	CO1	Understand, analyze and apply the role of languages like HTML, DHTML,CSS, JavaScript, PHP and protocols in the workings of the web and web applications. Analyze a web project and identify its elements and attributes in comparison to traditional projects.
			CO2	Understand, analyze and build dynamic web pages using JavaScript (client side programming)
			CO3	Understand basic Javascript syntax for variable use, and standard language constructs, such as conditionals and loops.
			CO4	Understand the paradigm for dealing with form-based data, both from the syntax of HTML forms
			CO5	Understand, analyze and build interactive web applications using PHP.
			CO6	Understand, analyze and create XML forms with HTML and PHP.
	Software Engineering	PGDCA203	CO1	Select and implement different software development process models.
			CO2	Extract and analyze software requirements specifications for different projects.

			CO3	Develop some basic level of software architecture/design.
			CO4	Apply standard coding practices.
			CO5	Define the basic concepts and importance of Software project management concepts like cost estimation, scheduling and reviewing the progress.
			CO6	Apply different testing and debugging techniques and analyzing their effectiveness.
	Computer Based Accounting	PGDCA204	CO1	Learn about concepts of Accounting.
			CO2	Understand the concepts of loss & profit account .
			CO3	Understand the concepts of Computerized Financial Accounting.
			CO4	Learn about Stock Validation.
			CO5	Understand about the concepts of Reports.
			CO6	Understand about Accounting Package.
Practical	**Lab(Based on PGD-2101)**	PGDCA205	CO1	To Understand the principles and practice of object oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements.
			CO2	To Implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
			CO3	To Demonstrate the principles of object oriented programming.
			CO4	To Make use of members of classes found in the Java API.
			CO5	To Familiar with AWT Controls &JDBC connection.
			CO6	Minor Project.
	Lab(Based on	PGDCA206	CO1	Understand the fundamentals of web
			CO2	Develop basic Web Pages

PGD-2102)			CO3	Use different styles to the webpage elements
			CO4	Create dynamic., Interactive Webpages using JavaScript
			CO5	Use JavaScript to validate form entries
			CO6	Minor Project
	Project	**PGDCA207**	CO1	It makes the student confident in designing an Online Project
			CO2	Students are trained to meet the requirements of the Industry.
			CO3	Improvement in analytical and reasoning ability
			CO4	Exposure to a variety of research projects and activities in order to enrich their academic experience
			CO5	Apply standard coding practices. Develop skills in presentation and discussion of research topics in a public forum.
			CO6	Students can make itself minor project

Mapping of Course Outcomes(COs) with Programme Outcomes(POs)

Programme Outcome														
College Code	**Course Out-comes**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
Semester I														
PGDCA101	**CO1**	3	X	X	X	X	X	X	X	X	2	1	X

	CO2	X	2	X	X	X	1	X	X	X	1	X	X
	CO3	1	X	2	X	X	X	X	1	X	1	X	X
	CO4	X	X	X	X	X	X	2	X	1	X	1	X
	CO5	X	1	X	X	X	1	X	X	1	1	X	X
	CO6	X	X	1	X	X	X	X	X	1	1	X	X
PGDCA102	**CO1**	X	X	1	X	X	3	X	X	X	X	X	X
	CO2	X	2	X	X	X	X	X	X	X	2	X	1
	CO3	X	X	2	2	X	X	X	X	X	2	X	X
	CO4	X	X	X	1	X	X	X	X	X	2	X	1
	CO5	X	1	X	X	X	X	X	X	X	1	X	1
	CO6	X	X	X	2	X	X	X	X	X	1	X	X
PGDCA103	**CO1**	X	2	X	X	X	X	X	X	X	2	1	X
	CO2	X	3	1	X	X	X	X	X	X	1	X	X
	CO3	X	2	X	X	X	X	X	X	2	2	X	X
	CO4	X	3	X	2	X	X	X	X	1	1	X	X
	CO5	X	X	X	X	X	X	X	2	X	1	1	X
	CO6	X	X	X	X	X	X	X	2	2	1	1	X
PGDCA104	**CO1**	X	2	X	X	X	X	X	X	2	X	X	1
	CO2	X	3	1	X	X	X	X	X	1	1	X	X
	CO3	X	2	X	X	X	X	X	X	1	2	2	X
	CO4	X	3	X	X	X	X	X	X	X	X	X	X
	CO5	X	X	X	X	X	X	X	2	1	2	X	X
	CO6	X	X	X	X	X	X	X	2	2	2	X	X
PGDCA105	**CO1**	3	X	X	X	X	X	X	X	X	2	1	X
	CO2	X	2	X	X	X	1	X	X	X	1	X	X
	CO3	1	X	2	X	X	X	X	1	X	1	X	X
	CO4	X	X	X	X	X	X	2	X	1	X	1	X
	CO5	X	1	X	X	X	1	X	X	1	1	X	X
	CO6	X	X	1	X	X	X	X	X	1	1	X	X
PGDCA106	**CO1**	X	2	X	X	X	X	X	X	X	2	1	X

	CO2	X	3	1	X	X	X	X	X	X	1	X	X
	CO3	X	2	X	X	X	X	X	X	2	2	X	X
	CO4	X	3	X	2	X	X	X	X	1	1	X	X
	CO5	X	X	X	X	X	X	X	2	X	1	1	X
	CO6	X	X	X	X	X	X	X	2	2	1	1	X
PGDCA201	**CO1**	X	2	X	X	X	X	X	X	X	1	1	X
	CO2	X	3	1	X	X	X	X	X	1	1	X	X
	CO3	X	2	X	X	X	X	X	X	2	2	X	X
	CO4	X	31	X	2	1	X	X	X	1	1	X	X
	CO5	X	X	X	X	X	X	X	2	X	1	1	X
	CO6	X	X	X	X	X	1	X	2	2	1	1	1
PGDCA202	**CO1**	X	2	3	X	X	X	X	X	X	3	X	1
	CO2	X	X	X	X	X	X	X	X	1	2	X	3
	CO3	X	X	X	X	X	2	X	X	X	X	X	3
	CO4	X	1	X	X	X	X	X	X	X	X	X	X
	CO5	X	X	2	X	X	X	X	1	X	X	X	3
	CO6	X	X	X	X	X	X	X	X	X	X	X	2
PGDCA203	**CO1**	X	1	1	X	X	X	1	1	1	X	X	X
	CO2	X	X	1	1	X	1	X	X	1	1	X	X
	CO3	1	X	X	1	X	X	1	1	X	X	X	X
	CO4	1	1	X	X	1	1	X	X	X	1	1	1
	CO5	1	1	1	X	X	1	1	X	X	X	1	1
	CO6	X	X	1	1	X	X	1	1	X	X	1	1
PGDCA204	**CO1**	X	2	3	X	X	X	X	X	X	3	X	1
	CO2	X	X	X	X	X	X	X	X	1	2	X	3
	CO3	X	X	X	X	X	2	X	X	X	X	X	3
	CO4	X	1	X	X	X	X	X	X	X	X	X	X
	CO5	X	X	2	X	X	X	X	1	X	X	X	3
	CO6	X	X	X	X	X	X	X	X	X	X	X	2
PGDCA205	**CO1**	X	1	1	X	X	X	1	1	1	X	X	X

	CO2	X	X	1	1	X	1	X	X	1	1	X	X
	CO3	1	X	1	1	X	X	1	1	X	X	X	X
	CO4	1	1	X	X	X	X	X	X	X	1	1	1
	CO5	1	1	1	X	X	1	1	X	1	X	1	1
	CO6	X	X	1	1	X	X	1	1	X	X	1	1
PGDCA206	CO1	X	2	X	X	X	X	X	X	X	2	X	1
	CO2	X	X	X	X	X	X	X	X	1	2	X	2
	CO3	1	X	X	X	X	2	X	X	X	X	X	X
	CO4	X	1	X	X	X	X	X	X	X	X	X	X
	CO5	X	X	3	X	X	X	X	1	X	X	X	X
	CO6	X	X	X	X	X	2	X	X	X	X	X	2

Mapping of Course Outcomes (COs) with ProgrammeSpecificOutcomes(PSOs)

College Code	Course Outcome	Program Specific Outcome				
		PSO 1	PSO2	PSO3	PSO4	PSO5
Semester I						
		PSO 1	PSO2	PSO3	PSO4	PSO5
PGDCA101	CO1	2	2	X	X	X
	CO2	X	2	X	X	X
	CO3	3	2	1	X	2
	CO4	3	2	X	1	2
	CO5	X	1	X	2	X
	CO6	X	1	X	2	X
PGDCA102	CO1	X	2	3	X	X
	CO2	X	3	X	2	3
	CO3	X	2	X	X	X
	CO4	X	2	X	X	X
	CO5	X	2	2	X	X

	CO6	3	2	3	3	X
PGDCA103	**CO1**	2	X	2	X	X
	CO2	1	X	3	X	X
	CO3	2	X	1	X	X
	CO4	2	X	2	X	X
	CO5	X	X	X	2	2
	CO6	1	X	X	1	2
PGDCA104	**CO1**	X	3	2	X	X
	CO2	1	3	3	X	X
	CO3	2	3	1	X	X
	CO4	2	3	1	X	X
	CO5	X	3	1	2	2
	CO6	1	3	1	3	2
PGDCA105	**CO1**	2	2	X	X	X
	CO2	X	2	X	X	X
	CO3	3	2	1	X	2
	CO4	3	2	X	1	2
	CO5	X	1	X	2	X
	CO6	X	1	X	2	X
PGDCA106	**CO1**	2	X	2	X	X
	CO2	1	X	3	X	X
	CO3	2	X	1	X	X
	CO4	2	X	2	X	X
	CO5	X	X	X	2	2
	CO6	1	X	X	1	2
Semester II						
PGDCA201	**CO1**	2	X	2	X	X
	CO2	1	X	2	1	X
	CO3	2	X	1	X	X
	CO4	2	1	2	X	X

	CO5	X	X	X	2	2
	CO6	1	X	X	1	1
PGDCA202	**CO1**	2	1	1	X	X
	CO2	2	X	X	X	1
	CO3	1	X	X	2	X
	CO4	1	X	X	X	3
	CO5	X	2	2	X	X
	CO6	3	2	X	X	X
PGDCA203	**CO1**	2	1	X	X	1
	CO2	1	X	1	1	X
	CO3	X	X	1	1	X
	CO4	2	1	X	X	1
	CO5	1	1	X	X	1
	CO6	1	1	X	X	1
PGDCA204	**CO1**	2	1	1	X	X
	CO2	2	X	X	X	1
	CO3	1	X	X	2	X
	CO4	1	X	X	X	3
	CO5	X	2	2	X	X
	CO6	3	2	X	X	X
PGDCA205	**CO1**	1	1	1	X	X
	CO2	2	X	X	X	1
	CO3	1	1	X	2	X
	CO4	1	X	X	X	3
	CO5	X	2	X	1	X
	CO6	3	2	X	X	X
PGDCA206	**CO1**	2	1	1	X	X
	CO2	2	X	X	X	1
	CO3	1	2	X	2	X
	CO4	1	X	X	X	3

CO5	X	2	2	X	X
CO6	3	2	X	1	X