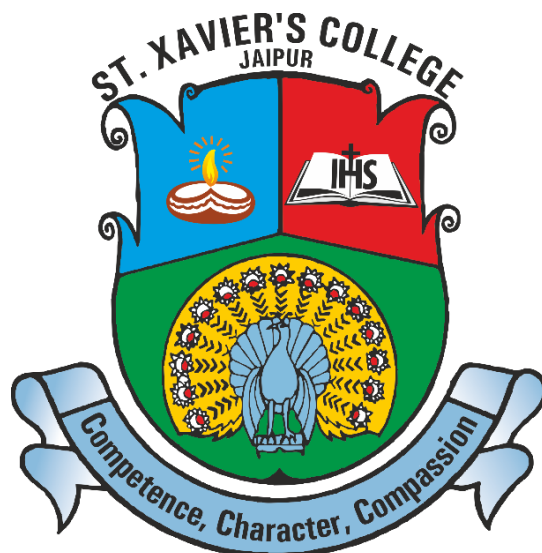


ST. XAVIER'S COLLEGE JAIPUR

Nevta - Mahapura Road, Jaipur - 302029, Rajasthan, India

Affiliated to the University of Rajasthan

Approved under Section 2(f) & 12(B) of the UGC Act, 1956



COURSE OUTCOMES

B.C.A.

(Bachelor of Computer Applications)

Department of Computer Science

(Session 2021-2024)

Course Outcomes (COs)

B.C.A. Part-I

The Learners will be able to:

101 (Theory): Elementary Physics

CO 1.	Elaborate the basic terminology/definitions of electrical and electronics	U
CO 2.	Apply the knowledge of theorems/laws to analyse the simple circuits	P
CO 3.	Employ the principles of electromagnetic induction in electrical applications	P
CO 4.	Acquire understanding of logic gates and minimise Boolean functions using Karnaugh maps and "don't care" conditions	P
CO 5.	Assess, analyse and design various combinational and sequential circuits	E

102 (Theory): Basic Mathematics

CO 1.	Identify matrix operations	K
CO 2.	Describe the meaning of limit, continuity, and differentiation	K
CO 3.	Evaluate a definite integral using the Fundamental Theorem of Calculus	E
CO 4.	Identify a general method for constructing solutions to inhomogeneous linear constant-coefficient second-order equations	K
CO 5.	Demonstrate scalar multiplication, magnitude, vector multiplication, the slope of a straight line, centre, radius, and the equation of a circle	P

103 (Theory): General English

CO 1.	Review and apply knowledge of communication and language	K
CO 2.	Evaluate academic writing associated with the discipline of communication	E
CO 3.	Develop skills to work collaboratively, managing conflict, understanding small group processes, active listening, appropriate self-disclosure, etc.	S
CO 4.	Identify different types of interviews and enhance competence	K
CO 5.	Create resume, cover letter, and profile on professional social media platforms	S
CO 6.	Compose various types of business reports	S

Course Outcomes (COs)

B.C.A. Part-I

104 (Theory): Principles of Programming Language through C

CO 1.	Describe the basics of programming language	U
CO 2.	Enumerate the basics of algorithms and flowcharts	K
CO 3.	Design and debug programmes in C language	S
CO 4.	Examine different data types and operators to write programmes	P
CO 5.	Formulate, evaluate, and analyse the problems by applying programming concepts using decision control statements and loop control statements	S
CO 6.	Solve problems by applying programming concepts using arrays, structures, pointers, and functions	P
CO 7.	Create meaningful visual media	S
CO 8.	Discuss different processes involved in business writing	U

105 (Theory): Computer Organisation

CO 1.	Identify functional units and illustrate register transfer operations	K
CO 2.	Review the internal organisation of the computer and its instructions	U
CO 3.	Apply fixed and floating-point algorithms in analysing micro programme instructions.	P
CO 4.	Summarise the memory organisation and pipelining concepts	U

Course Outcomes (COs)

B.C.A. Part-I

106 (Theory): Office Management Tools

CO 1.	Describe the basic features of Microsoft Office, Windows basics, and file management	U
CO 2.	Demonstrate familiarity with Word, Excel, Access, PowerPoint, email, and Internet basics	P
CO 3.	Differentiate between Microsoft Office programmes and their application in different contexts such as to create professional and academic documents, etc.	A
CO 4.	Use Microsoft Office programmes to create personal, academic, and business documents following current professional standards	P

107 (Practical): Technical Writing and Communications Skills

CO 1.	Enumerate the importance and use of the English Language	K
CO 2.	Express and introduce themselves professionally	P
CO 3.	Review grammatical topics and learn to write correct and coherent sentences	U
CO 4.	Employ effective communication and write confidently in the written form	P

Course Outcomes (COs)		
B.C.A. Part-I		
108 (Practical): C Programming Lab		
CO 1.	Identify different programming approaches in procedural programming	K
CO 2.	Analyse and critically evaluate various programming approaches	A
CO 3.	Design different applications or projects	S
CO 4.	Discuss different programming approaches and concepts in project or application development	U
CO 5.	Demonstrate awareness of the programming paradigm and application development	P

109 (Practical): Office Management Tools		
CO 1.	Explore operating systems, types, explaining various commands of DOS	P
CO 2.	Explore MS- Word, analysis of the various menus of MS- Word, knowledge of converting word documents into various formats, explaining Mail Merge	P
CO 3.	Explore MS- Excel, working on formulas, introduction to cell Reference and the different types., working on charts, graphs, macros	P
CO 4.	Create PowerPoint presentations, working on multimedia and special effects	S
CO 5.	Explore MS- Access, creating and editing database, forms, queries, reports, tables	P
CO 6.	Examine sorting and indexing database	P

Course Outcomes (COs)

B.C.A. Part-I

110 (Practical): Typing Skills Lab (Hindi and English Typing)

CO 1.	Explore Hindi Characters in typing	P
CO 2.	Classify different functions of keys on keyboards	U
CO 3.	Review the importance of touch keyboarding	K
CO 4.	Employ correct typing techniques	P
CO 5.	Use appropriate formatting in business and academic documents	P

Course Outcomes (COs)		
B.C.A. Part-II		
201 (Theory): Business Accountancy		
CO 1.	Enumerate basic concepts and terminologies of accounting	K
CO 2.	Review the process of recording and classifying business transactions and events	U
CO 3.	Recognise commonly used financial statements, their components and how information from business transactions flows into these statements	K
CO 4.	Examine financial statements, viz., Profit and Loss Account, Balance Sheet, and cash flow statement of a sole proprietor	P
CO 5.	Demonstrate knowledge of the preparation of financial statements and or financial schedules in accordance with generally accepted accounting principles	P

202 (Theory): Discrete Mathematics		
CO 1.	Apply mathematical logic to solve problems	P
CO 2.	Review sets, relations, functions and discrete structures	U
CO 3.	Use logical notations to define and reason fundamental mathematical concepts such as sets of relations and functions	P
CO 4.	Formulate problems and solve recurrence relations	S
CO 5.	Model and solve real-world problems using graphs and trees	S

Course Outcomes (COs)

B.C.A. Part-II

203 (Theory): Operating System

CO 1.	Describe the basics of the operating systems and mechanisms of OS to handle processes, threads, and their communication	K
CO 2.	Analyse memory management and its allocation policies	A
CO 3.	Illustrate different conditions for deadlock and their possible solutions	P
CO 4.	Discuss the storage management policies with respect to different storage management technologies	U
CO 5.	Evaluate the concept of the operating system with respect to UNIX, Linux, Time, and mobile OS	E

204 (Theory): Database Management System

CO 1.	Describe databases and different types of databases	U
CO 2.	Develop normalisation and ER modelling that are used concurrently to produce a good database design	S
CO 3.	Recognise the relationships among entities and the attributes of those entities, and in designing an entity relationship diagram to capture those relationships	K
CO 4.	Develop a set of queries to handle a specified set of typical user inquiries for information extraction from the database	S

Course Outcomes (COs)

B.C.A. Part-II

205 (Theory): Web Application Development

CO 1.	Apply HTML, CSS, and JavaScript in web development	P
CO 2.	Analyse and explore a web page and identify its elements and attributes	A
CO 3.	Design static web pages using HTML and CSS	S
CO 4.	Create dynamic web pages using JavaScript	S

206(A) (Theory): Object Oriented Programming (C++)

CO 1.	Describe object-oriented software code of medium-to-high complexity	U
CO 2.	Apply different types of object-oriented libraries when required for implementation	P
CO 3.	Enumerate the basic principles of creating object-oriented applications or programmes	K
CO 4.	Examine fundamental concepts of computer science: structure of the computational process, algorithms, and complexity of computation	A

Course Outcomes (COs)		
B.C.A. Part-II		
206(B) (Theory): VB.NET		
CO 1.	Explore .NET Framework programming	P
CO 2.	Describe the basic structure of a Visual Basic.NET project and use main features of the integrated development environment (IDE)	K
CO 3.	Acquire deep knowledge of data types, operators and control statements in VB.NET	P
CO 4.	Apply the concept of arrays, procedures and structures using various VB.NET controls	P
CO 5.	Create applications using Microsoft Windows Forms	S
CO 6.	Discuss exceptions in .NET environment	U
CO 7.	Use ADO.NET for Database connectivity	P

207 (Practical): Database Management System Lab		
CO 1.	Describe the underlying concepts of database technologies, design and implement a database schema for a given problem domain, and normalisation techniques	U
CO 2.	Use SQL DML/DDDL commands in populating and querying a database, enforce integrity constraints on a database	P
CO 3.	Describe transaction and concurrency, database concepts and structure	U
CO 4.	Review the objectives of data and information management and understand the data modelling and database development process	K
CO 5.	Construct and normalise conceptual data models. Implement a relational database into a database management system	S

Course Outcomes (COs)

B.C.A. Part-II

208 (Practical): Web Design and Multimedia

CO 1.	Recognise the key elements of the world wide web	K
CO 2.	Recognise the components available for the security and privacy of the systems and network	K
CO 3.	Create HTML web pages and execute them, different HTML tags	S
CO 4.	Employ different styling ways and related attributes on webpages, filters, frames and layers on webpages	P
CO 5.	Create web pages with JavaScript	S
CO 6.	Use jQuery in web pages and create pages with AJAX	P

209 (Practical): Multimedia

CO 1.	Describe the basic concepts and terminology of the Web and its services	K
CO 2.	Analyse a web page and identify its elements and attributes	A
CO 3.	Create web pages using HTML, DHTML, and Cascading Style Sheets	S
CO 4.	Design dynamic web pages using JavaScript (Client-side programming)	S
CO 5.	Develop proficiency in using basic and advanced tools and features of Photoshop to manipulate images and graphics	S
CO 6.	Develop skills in CorelDraw for designing custom web graphics for business and personal websites	S

Course Outcomes (COs)

B.C.A. Part-II

210(A) (Practical): Object Oriented Programming (C++)

CO 1.	Explore object-oriented programming approach in connection with the C++ language	P
CO 2.	Differentiate between the top-down and bottom-up approach	U
CO 3.	Apply the concepts of object-oriented programming in practical application	P
CO 4.	Apply virtual and pure virtual functions & complex programming situations	P
CO 5.	Create programmes using the concept of polymorphism	S
CO 6.	Explore programming assignments based on encapsulation and dynamic binding	P
CO 7.	Use C++ used in real-time programming	P
CO 8.	Illustrate the process of data file manipulations using C++	P

Course Outcomes (COs)

B.C.A. Part-II

210(B) (Practical): VB.NET

CO 1.	Explore .NET Framework	P
CO 2.	Design projects Visual Basic.NET and use main features of the integrated development environment (IDE)	S
CO 3.	Use data types, operators, and control statements in VB.NET	P
CO 4.	Employ the concept of arrays, procedures and structures using various VB.NET controls	P
CO 5.	Create applications using Microsoft Windows Forms	S
CO 6.	Design self-written codes to handle exceptions	S
CO 7.	Use ADO.NET in database connectivity	P

Course Outcomes (COs)

B.C.A. Part-III

301 (Theory): Data Structure and Algorithm

CO 1.	Use linear and non-linear data structures like stacks, queues, linked lists etc	P
CO 2.	Define basic static and dynamic data structures and relevant standard algorithms for them: stack, queue, dynamically linked lists, trees, graphs, heap, priority queue, hash tables, sorting algorithms, and min-max algorithm	K
CO 3.	Analyse appropriate data structures as applied to specified problem definitions	A
CO 4.	Show operations like searching, insertion, deletion, and traversing mechanism	P

302 (Theory): System Design Concepts

CO 1.	Assess analysis and design tools and techniques	E
CO 2.	Examine fundamental software testing techniques and strategies	P
CO 3.	Describe principles of system implementation and maintenance	U
CO 4.	Apply various estimation models to determine the cost of software projects and illustrate risks	P
CO 5.	Evaluate the role of information systems in today's competitive business environment	E

Course Outcomes (COs)		
B.C.A. Part-III		
303 (Theory): Networking Technologies		
CO 1.	Describe Signals, OSI & TCP/IP reference models and discuss the functionalities of each layer in these models	U
CO 2.	Discuss and analyse flow control and error control mechanisms and apply them using standard data link layer protocols	P
CO 3.	Design subnets and calculate the IP addresses to fulfil the network requirements of an organisation	S
CO 4.	Analyse and apply various routing algorithms to find the shortest paths for packet delivery	A
CO 5.	Elaborate Transport Layer Protocols (UDP, TCP) and suggest appropriate protocols for reliable/ unreliable communication	U
CO 6.	Analyse the features and operations of various application layer protocols such as HTTP, DNS and SMTP	A

304 (Theory): JAVA		
CO 1.	Describe the basic principles of OOP and JAVA Programming	K
CO 2.	Analyse various techniques and methods used in JAVA	A
CO 3.	Employ various concepts of JAVA to solve problems	P
CO 4.	Develop Web and Desktop Applications using JAVA	S

Course Outcomes (COs)		
B.C.A. Part-III		
305 (Theory): e-Commerce		
CO 1.	Demonstrate an understanding of the foundations and importance of e-commerce	P
CO 2.	Analyse the impact of e-commerce on business models and strategy	A
CO 3.	Describe the infrastructure for e-commerce	K
CO 4.	Describe the key features of the Internet, Intranets and Extranets and explain how they relate to each other	K
CO 5.	Discuss e-Commerce Security	U
CO 6.	Assess electronic payment systems	E

306(A) (Theory): PHP		
CO 1.	Employ PHP script using Decisions and Loops	P
CO 2.	Develop PHP applications using Strings, Arrays and Functions	S
CO 3.	Design object-oriented programming (OOP) principles for PHP and use HTML form elements that work with any server-side language	S
CO 4.	Illustrate and insert data using PHP and MySQL	A

Course Outcomes (COs)		
B.C.A. Part-III		
306(B) (Theory): LINUX		
CO 1.	Describe the basics of Linux Operating System and File System, set of commands and utilities in Linux systems	K
CO 2.	Create shell-scripts through shell programming, investigate & manage processes, control, structure, loops, cases and functions in shell programming	S
CO 3.	Compare different editors (vi, etc.) and use them to create a shell script for a given problem	U
CO 4.	Demonstrate familiarity with pipes and redirection, LINUX environment, traps, signals, filter parameters, filter options, and regular expressions	P
CO 5.	Discuss the role of system administration and network services in Linux	U

307: Network Technologies Lab (Practical)		
CO 1.	Describe the fundamental principles of computer networking	U
CO 2.	Examine the details and functionality of layered network architecture	P
CO 3.	Apply mathematical foundations to solve computational problems in computer networking	P
CO 4.	Analyse the performance of various communication protocols	A
CO 5.	Compare routing algorithms and their functions	U
CO 6.	Practice packet /file transmission between nodes	P

Course Outcomes (COs)

B.C.A. Part-III

308 (Practical): JAVA Lab

CO 1.	Describe the basic concepts of scripting and the contributions of scripting language	U
CO 2.	Explore PYTHON data structures like Lists, Tuples, Sets and dictionaries	P
CO 3.	Create practical and contemporary applications using functions and regular expressions	S
CO 4.	Create and handle files in JAVA	S

309(B) (Practical): PHP

CO 1.	Explore PHP	P
CO 2.	Describe programmes on server-side scripting and client-side- scripting, data types, and syntax	K
CO 3.	Examine programmes on decision-making statements, iterations arrays and their types	P
CO 4.	Discuss programmes on the concept of string functions performed on strings	U
CO 5.	Analyse programmes on functions, their types, and arguments	A
CO 6.	Describe programmes on form handling, exception, try to catch, file handling operations	U
CO 7.	Create programmes on database handling	S

Course Outcomes (COs)		
B.C.A. Part-III		
309(C) (Practical): LINUX		
CO 1.	Recognise the booting and interface of the Linux operating system	K
CO 2.	Compute and test commands related to file and data handling, arithmetic operations, redirection and piping	P
CO 3.	Compute user and administration-specific operations. Execute shutdown and user management-specific commands	P
CO 4.	Handle dual operating systems in one computer, file permissions and directories	S
CO 5.	Explore different modes of vi Editor, able to use the commands of vi editor	P
CO 6.	Create and execute shell scripts	S

310: Project		
CO 1.	Review various projects	K
CO 2.	Identifying errors in a working model	K
CO 3.	Demonstrate critical thinking skills and inquiring skills through application-oriented project development in CS & IT in a teamwork environment	P
CO 4.	Enhance literature survey skills, communication skills and public speaking skills through written and oral presentations	S
CO 5.	Discuss problem-solving skills. Learn proposal development skills to initiate an application-oriented project in the areas of CS & IT	U

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COURSE OUTCOMES

B.C.A.

(Bachelor of Computer Applications)

Department of Computer Science

(Session 2022-2025)

Course Outcomes (COs)

B.C.A. Part-I

101 (Theory): Computer Fundamentals and Office Management Tools

CO 1.	Recall the basics of computers	K
CO 2.	Describe input and output devices of computers and how they work. Recognise the basic terminology used in computer programming	U
CO 3.	Identify and represent numbers in different number systems	K
CO 4.	Analyse and use office automation packages, internet etc.	A
CO 5.	Enhance the ability of essential for common man for day-to-day office management, and e-governance	S
CO 6.	Evaluate how to use software packages in day-to-day activities	E

102 (Theory): Computer Organisation

CO 1.	Identify functional units and illustrate register transfer operations	K
CO 2.	Elaborate the internal organisation of the computer and its instructions	U
CO 3.	Use fixed and floating-point algorithms and analyse microprogram instructions	P
CO 4.	Summarise the memory organisation and pipelining concepts	U
CO 5.	Illustrate data transfer between a central computer and I/O devices	P

Course Outcomes (COs)		
B.C.A. Part-I		
103 (Theory): Operating System		
CO 1.	Describe the basics of the operating systems, and mechanisms of OS to handle processes, threads, and their communication	K
CO 2.	Analyse the memory management and its allocation policies	A
CO 3.	Illustrate different conditions for deadlock and their possible solutions	P
CO 4.	Discuss the storage management policies concerning different storage management technologies	U
CO 5.	Evaluate the concept of the operating system with respect to Unix, Linux, time, and mobile OS	E

104 (Theory): Principles of Programming Language through C		
CO 1.	Enumerate the basics of programming language	K
CO 2.	Describe the basics of algorithms and flowcharts	U
CO 3.	Write, compile and debug programmes in C language	S
CO 4.	Use different data types and operators to write programmes	P
CO 5.	Evaluate and analyse the problems by applying programming concepts using decision control statements and loop control statements	E
CO 6.	Formulate the problem by applying the programming concepts using array, structure, pointers and functions	S

Course Outcomes (COs)

B.C.A. Part-I

105 (Theory): Web Application Development

CO 1.	Describe the basics of the Internet and concepts like Internet service providers, internet connections, and Internet protocols	K
CO 2.	Discuss basics of e-mail, mailing lists, newsgroups, internet relay chat, and instant messaging	U
CO 3.	Describe internet services: Telnet, FTP, and the Web	K
CO 4.	Analyse a web page and identify its elements and attributes	A
CO 5.	Create web pages using HTML and Cascading Style Sheets	S
CO 6.	Build dynamic web pages using JavaScript (Client-side programming)	S

106 (Theory): Basic Mathematics

CO 1.	Identify matrix operations	K
CO 2.	Summarise the meaning of limit, continuity, and differentiation	U
CO 3.	Evaluate a definite integral using the fundamental theorem of calculus	P
CO 4.	Identify a general method for constructing solutions to inhomogeneous linear constant-coefficient Second-order equations	K
CO 5.	Demonstrate scalar multiplication, magnitude, vector multiplication and simple application of vectors, the slope of a straight line, centre, radius, and the equation of a circle	P

Course Outcomes (COs)

B.C.A. Part-I

107 (Practical): Office Management Tools Lab

CO 1.	Enumerate the basic features of Microsoft Office, Windows basics, and file management	K
CO 2.	Explore Word, Excel, Access, PowerPoint, email, and Internet basics	P
CO 3.	Recognise the application of Microsoft Office programmes to create professional and academic documents	K
CO 4.	Use Microsoft Office programmes to create personal, academic, and business documents following current professional and/or industry standards	S

108 (Practical): C Programming Lab

CO 1.	Identify different programming approaches in procedural programming	K
CO 2.	Analyse and critically evaluate various programming approaches which will help in the implementation of different applications or projects	E
CO 3.	Select and implement different programming approaches and concepts in project or application development	K
CO 4.	Demonstrate awareness of the programming paradigm in terms of understanding the concept of application development	P

Course Outcomes (COs)

B.C.A. Part-I

109 (Practical): Web Application Development Lab

CO 1.	Describe the role of languages like HTML, CSS, and JavaScript in web development	U
CO 2.	Analyse a web page and identify its elements and attributes	U
CO 3.	Design static web pages using HTML and CSS	S
CO 4.	Create dynamic web pages using JavaScript	S

110 (Practical): Communication Skills Lab

CO 1.	Express effectively through verbal/oral communication and listening skills	U
CO 2.	Write precise briefs or reports and technical documents	S
CO 3.	Develop confidence through group discussions, meetings, interviews. Prepare and deliver presentations	S
CO 4.	Develop effective habits through goal, target setting, self-motivation and creative thinking	S
CO 5.	Analyse heterogeneous teams through the knowledge of teamwork, interpersonal relationships, conflict management and leadership quality	A

Course Outcomes (COs)

B.C.A. Part-II

201 (Theory): Object Oriented Programming (C++)

CO 1.	Investigate different concepts of programming approaches in terms of the application or project development	P
CO 2.	Create methods and programmes within the field of procedural programming as well as develop logical and analytical approaches to programming problems independently	S
CO 3.	Apply Object Oriented Programming in new areas within the field of basic and advanced programming	P
CO 4.	Develop independently relevant applications using self-logic in the field of programming languages	S

202 (Theory): Database Management System

CO 1.	Investigate databases, different types of databases, and why they are valuable assets for decision-making	P
CO 2.	Develop normalisation and ER modelling that are used concurrently to produce a good database design	S
CO 3.	Recognise the relationships among entities and the attributes of those entities, and in designing an entity relationship diagram to capture those relationships	K
CO 4.	Develop a set of queries to handle a specified set of typical user inquiries for information extraction from the database	S

Course Outcomes (COs)		
B.C.A. Part-II		
203 (Theory): Software Engineering		
CO 1.	Define basic concepts of software development such as requirement analysis, designing, testing, and debugging etc.	K
CO 2.	Describe different types of models that can be used to design software	U
CO 3.	Design solutions to a given problem and analyse the best one based on parameters like cost, time, and knowledge	P
CO 4.	Apply various testing tools and techniques	P
CO 5.	Illustrate the importance of reliability in software development	S

204 (Theory): Data Structure and Algorithm		
CO 1.	Use linear and non-linear data structures like stacks, queues, linked lists etc.	P
CO 2.	Define basic static and dynamic data structures and relevant standard algorithms for them: stack, queue, dynamically linked lists, trees, graphs, heap, priority queue, hash tables, sorting algorithms, and min-max algorithm	K
CO 3.	Evaluate data structures as applied to specified problem definitions	E
CO 4.	Handle operations like searching, insertion, deletion, and traversing mechanism	S

Course Outcomes (COs)		
B.C.A. Part-II		
205 (Theory): Cloud Computing		
CO 1.	Investigate different concepts of cloud computing in terms of an individual and organisation	P
CO 2.	Discuss theories, methods and interpretations of theories within the field of cloud computing as well as solve theoretical and practical problems independently	U
CO 3.	Apply cloud computing knowledge in new areas within the field of cloud computing	P
CO 4.	Develop web applications using the concept of cloud computing	S

207 (Practical): Object Oriented Programming (C++) Lab		
CO 1.	Describe Object oriented-based software code of medium-to-high complexity	U
CO 2.	Use and implement standard and different types of Object-oriented libraries	P
CO 3.	Examine the basic principles of creating Object-oriented applications or programmes	P
CO 4.	Review fundamental concepts of computer science: structure of the computational process, algorithms, and complexity of computation	K

Course Outcomes (COs)

B.C.A. Part-II

208 (Practical): Database Management System Lab

CO 1.	Design and implement a database schema for a given problem domain, and normalisation techniques	S
CO 2.	Handle a query in database using SQL DML/DDDL commands, enforce integrity constraints on a database	S
CO 3.	Explore transaction and concurrency, database concepts and structures	P
CO 4.	Discuss the objectives of data and information management, understand data modelling and database development process	U
CO 5.	Construct and normalise conceptual data models, implement a relational database into a database management system	S

209 (Practical): Data Structure and Algorithm Lab

CO 1.	Investigate different concepts of data structure in terms of application or project development	P
CO 2.	Create methods and programmes within the field procedural programming as well as develop logical and analytical approaches to programming problems independently	S
CO 3.	Apply knowledge of Data Structure and Algorithm in new areas within the field of basic and advanced programming	P
CO 4.	Develop relevant applications using self-logic in the field of programming languages which includes performing experiments/programmes and interpreting their results	S

Course Outcomes (COs)

B.C.A. Part-II

A01 (Elective): .NET

CO 1.	Describe the basic structure of C# and Net Programming	U
CO 2.	Explore the basic Libraries and their functions	P
CO 3.	Identify the basic concepts underlying the ASP net and C# net	K
CO 4.	Compare NET framework and compact framework	A

A02 (Elective): PHP

CO 1.	Employ PHP script using Decisions and Loops	P
CO 2.	Develop PHP applications using Strings, Arrays and Functions	S
CO 3.	Show and insert data using PHP and MySQL	P
CO 4.	Design object-oriented programming (OOP) principles for PHP and use HTML form elements that work with any server-side language	S

Course Outcomes (COs)		
B.C.A. Part-II		
A03 (Elective): Data Science		
CO 1.	Describe basic concepts and associated terminology of data science	U
CO 2.	Employ descriptive and inferential methods to summarise data and identify associations and relationships as part of data analytics	P
CO 3.	Identify and appropriately acknowledge sources of data	K
CO 4.	Apply basic data cleaning techniques to prepare data for analysis and presentation as part of the data science process	P
CO 5.	Recognise, describe, and calculate the measures of location of data, centre of data, and spread of data	K
CO 6.	Use appropriate data science tools and technology to collect, process, transform, summarise, and visualise data	P

B01 Elective (Practical): .NET Lab		
CO 1.	Demonstrate an understanding of C# syntax through program design	P
CO 2.	Develop a working knowledge of C# programming constructs and the NET Framework	S
CO 3.	Write an object-oriented program using custom classes	S
CO 4.	Build and debug well-formed Web Forms with ASP NET Controls	S
CO 5.	Create custom controls with user controls	S
CO 6.	Use ADO NET in a web application to read, insert, and update data in a database	P

Course Outcomes (COs)

B.C.A. Part-II

BO2 (Elective): PHP

CO 1.	Analyse PHP scripts and determine their behaviour	A
CO 2.	Construct PHP scripts to create dynamic web content	S
CO 3.	Create PHP scripts capable of inserting and modifying data in a MySQL database	S
CO 4.	Design web pages with the ability to retrieve and present data from a MySQL database	S

BO3 (Elective): DATA SCIENCE

CO 1.	Describe Regression, Correlation, and Probability	U
CO 2.	Use of PYTHON scripts and Libraries	P
CO 3.	Illustrate working with JUPITER editor	A
CO 4.	Employ SQL and R in analysing data	P

Course Outcomes (COs)

B.C.A. Part-III

301 (Theory): JAVA

CO 1.	Describe the basic principles of OOP and JAVA Programming	U
CO 2.	Analyse various techniques and methods used in JAVA	A
CO 3.	Employ various concepts of JAVA to solve problems	P
CO 4.	Develop Web and Desktop Applications using JAVA	S

302 (Theory): PYTHON

CO 1.	Use lists, tuples, and dictionaries in PYTHON and identify PYTHON object types	P
CO 2.	Use indexing and slicing to access data in PYTHON	P
CO 3.	Use if-else statements and switch-case statements to write programmes in PYTHON to tackle any decision-making scenario	P
CO 4.	Discuss reading and writing files in PYTHON	U
CO 5.	Develop cost-effective, robust applications using the latest PYTHON trends and technologies	S
CO 6.	Build the system's entire web development process using various tools	S

Course Outcomes (COs)		
B.C.A. Part-III		
303 (Theory): Data Communication & Networking		
CO 1.	Describe the concept of Signals, OSI & TCP/IP reference models and discuss the functionalities of each layer in these models	U
CO 2.	Discuss and analyse flow control and error control mechanisms and apply them using standard data link layer protocols	U
CO 3.	Design subnets and calculate the IP addresses to fulfil the network requirements of an organisation	S
CO 4.	Analyse and apply various routing algorithms to find the shortest paths for packet delivery	A
CO 5.	Enumerate the details of Transport Layer Protocols (UDP, TCP) and suggest appropriate protocols for reliable/unreliable communication	K
CO 6.	Explore the features and operations of various application layer protocols such as HTTP, DNS and SMTP	P

304 (Theory): Artificial Intelligence		
CO 1.	Identify basic concepts and scope of Artificial Intelligence	K
CO 2.	Employ different AI search techniques and apply them to real-world problems	P
CO 3.	Apply basic principles of AI in solutions that require problem-solving, inference, perception, knowledge representation, and reasoning	P
CO 4.	Develop intelligent algorithms for constraint satisfaction problems and design intelligent systems for Game Playing	S
CO 5.	Classify different learning paradigms and their application in Neural Networks	U
CO 6.	Analyse concepts of Natural Language processing and discuss Expert systems	A

Course Outcomes (COs)		
B.C.A. Part-III		
305 (Theory): Digital Marketing		
CO 1.	Define the concept of digital marketing and its real-world iterations	K
CO 2.	Articulate innovative insights into digital marketing, enabling a competitive edge	U
CO 3.	Create and run digital media-based campaigns	S
CO 4.	Discover and use various tools such as social media, etc.	P
CO 5.	Examine ethical and moral issues, identify required actions, and demonstrate the ability to implement them	A

307 (Practical): JAVA Lab		
CO 1.	Identify the core concepts of Information Technology, both theoretical and applied	K
CO 2.	Investigate new technologies, tools, practices, and standards and relate them to their knowledge domain	A
CO 3.	Employ design and development tools and engage in systematic evaluation using current methodologies	P
CO 4.	Integrate IT knowledge and develop industry-oriented projects	S

Course Outcomes (COs)

B.C.A. Part-III

308 (Practical): PYTHON Lab

CO 1.	Describe the basic concepts of scripting and the contributions of scripting language	U
CO 2.	Explore PYTHON data structures like Lists, Tuples, Sets and dictionaries	P
CO 3.	Create practical and contemporary applications using Functions and Regular Expressions	S
CO 4.	Write and read files in PYTHON	K

309 (Practical): Digital Marketing Lab

CO 1.	Examine digital marketing tools like search engine optimisation and associated analytics	P
CO 2.	Apply digital marketing tools to a) improve websites' rankings and optimise them in the process b) Improve the brand's visibility c) improve the reach of brands, which physically is relatively difficult and less effective	P
CO 3.	Analyse the relative importance of digital marketing strategies to optimise digital marketing campaigns	A
CO 4.	Evaluate the performance of different social media in conjunction with the overall digital marketing plan	E
CO 5.	Design search engine optimisation and search engine marketing campaigns	S

310: Project

CO 1.	Review various projects	U
CO 2.	Identifying errors in a working model	K
CO 3.	Acquire critical thinking skills and inquiring skills through application-oriented project development in CS & IT in a teamwork environment	P
CO 4.	Acquire literature survey skills, communication skills and public speaking skills through written and oral presentations	P
CO 5.	Examine problem-solving skills to develop proposals to initiate an application-oriented project in the areas of CS & IT	A

Course Outcomes (COs)		
B.C.A. Part-III (Theory/Practical)		
CO1 (Elective): Data Warehousing and Data Mining		
CO 1.	Define the principles of Data Warehousing and Data Mining	K
CO 2.	Explore Data Warehouse architecture and its implementation	P
CO 3.	Describe the Architecture of a Data Mining system	U
CO 4.	Examine the various Data preprocessing Methods	A
CO 5.	Demonstrate classification and prediction of data	P

CO2 (Elective): Network Security and Cryptography		
CO 1.	Describe the basic security terminologies	U
CO 2.	Classify the encryption techniques	U
CO 3.	Illustrate various public key cryptographic techniques	S
CO 4.	Evaluate the authentication and hash algorithms	E
CO 5.	Discuss authentication applications	U
CO 6.	Recall basic concepts of system and web security	K

Course Outcomes (COs)

B.C.A. Part-III (Theory/Practical)

CO3 (Elective): Machine Learning

CO 1.	Compare different types of machine learning techniques and their applications in the real world	U
CO 2.	Apply various mathematical models for supervised machine learning models	P
CO 3.	Examine the unsupervised machine learning models through various clustering algorithms	P
CO 4.	Review probabilistic graphical models to represent complex systems and make predictions based on uncertain data	K
CO 5.	Illustrate reinforcement learning algorithms to solve real-time complex problems with an understanding of the trade-offs involved	A
CO 6.	Evaluate various machine learning algorithms through statistical learning techniques	E