S.U.S. Govt. College, Matak Majri, Karnal

DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS

PROGRAM OUT COMES (PO), PROGRAM SPECIFIC OUTCOMES (PSO), COURSE OUTCOMES (CO)

PROGRAM: BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

PO1:	(**Life long Learning**) Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological advancements in computer applications
PO2:	(**Engineering Knowledge**) Apply the knowledge of mathematics, science, engineering fundamentals, and computer applications to the solution of complex engineering problems.
PO3:	(**Solutions to Complex Problems**) Explore and design solutions for complex engineering problems and design system components or processes using computing technologies to meet the specified needs with appropriate norms.
PO4:	(**Ethics**)Apply ethical principles and commit to professional ethics, responsibilities and norms of the engineering practice.
PO5:	(**Project Management & Team Work**) Function effectively using engineering and management principles as a team leader or team member on multi disciplinary projects.
PO6:	(**Modern Tool Usage**) Select, integrate and apply efficiently the resources and contemporary IT tools to computer applications.
PO7:	(**InvestigationsofCoplexProblems**)Analyzeagivenreal-worldproblemtopropose relevant analysis for use in feasible computing solutions.
PO8	(**Communication**)Abilitytocommunicateeffectivelyonengineeringactivitieswiththe engineering community and the society at large.
PO9:	(**Environment and Susainability)** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO10:	(**Decision Making**) Design and conduct experiments, review the research-based knowledge, gather and interpret data to provide valid conclusions in the context of computer applications.
	Program Specific Outcomes (BCA)
PSO-1:	Ability to pursue a career with necessary skills in the area related to Computer Science and Applications.
PSO-2:	Ability to explore emerging technologies and provide innovative solutions to real-life applications

Semester-I

BCA-111	**Computer and Programming Fundamentals**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**Introduces basic concepts of computers, components and functional structure.**					
Course Outcomes (CO)						
CO1	Demonstration and implementation the layers of architectures in computer systems from digital logic to networks.					
CO2	Understanding of CPU components that how they are composed in terms of Digital Logic					
CO3	Design, analysis and implementation of assembly languages including function calls basic control structures					
CO4	Demonstrate functional knowledge of operating system and networks.					

BCA-112	**Windows and PC Software**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**To familiarize the students with the basics of Computer System and Excel concept**					
Course Outcomes (CO)						
CO1	To understand common features and requirements of Windows.					
CO2	To be able to manage hardware and software in Windows.					
CO3	To implement different options in spreadsheet for creating and editing worksheets.					
CO4	To implement advance features of excel for creating and editing worksheets.					

BCA-114	**Logical Organization of Computers-I**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**

6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**Introduces basic concepts of Number System, Boolean algebra, logic gates and combinational circuits.**					
Course Outcomes (CO)						
CO1	Identify, understand and apply different number systems and their codes.					
CO2	Analyze and apply the binary logic to simply the Boolean functions.					
CO3	Understand the different types of logic gates and their implementation.					
CO4	Understand the general concepts in digital logic design, including logic elements and their use in combinational logic circuit design.					

BCA-116	**Programming in C**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**		**80**	**20**	**100**	**3 Hrs.**
Purpose	**Introduces basic concepts of Programming and Solving Problems using C Language**					
Course Outcomes (CO)						
CO1	Develop their programming skills					
CO2	Be familiar with programming environment with C Program structure.					
CO3	Declaration of variables and constants and Understand operators, expressions and preprocessors.					
CO4	Understand arrays, it's declaration and uses.					
CO5	Understand the format of functions and their application in solving complex problems.					

BCA Semester-I							
Paper	**Lecture**	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
Mathematic Foundations –I	**6**	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**

Paper- BCA-113 Mathematic Foundations –I

Upon completion of this course, to be able to:

CO 1: To understand the concept of set theory, union of sets, intersection of sets and vein diagram and familiar with propositional calculus.

CO 2: To understand differentiability of different type of functions and to know about Graphs and algorithms Formation and solution of differential equations.

CO 3: To understand basic discrete structures such as numbers, sets, used in computer science.

CO 4: To familiarize with Determinant, Matrices and Formulate Limit, Continuity and Differentiability.

CO 5: To demonstrate a working to knowledge Definite and Indefinite Integrals and apply to knowledge of discrete mathematics appropriate to the discipline.

CO 6: To analyze and solve problems based on Matrix & determinants and to understand Statistics and its applications and also will be able to calculate Mean, median and mode.

Semester-II

BCA-121	Advanced Programming in C					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**		**80**	**20**	**100**	**3 Hrs.**
Purpose	**Introduces basic concepts of Programming and Solving Problems using C Language**					
Course Outcomes (CO)						
CO1	Develop their programming skills.					
CO2	Be familiar with strings and their applications					
CO3	Understand the declaration of pointers, their use, their arithmetic and applications with arrays, structures, functions and strings.					
CO4	Understand and implement structures, union and various macros constructs.					
CO5	To Implement the Files Input and output functions.					

BCA-122	Logical Organization-II					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**		**80**	**20**	**100**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Understand the concept and components of sequential Logic.					
CO2	Understand the structure, function and characteristics of various sequential circuits.					
CO3	Identify the elements of modern instruction sets and their impact on processor design.					
CO4	Understand the function of each element of a memory hierarchy.					
CO5	Analyze different methods for Computer I/O.					

BCA-124	Office Automation Tools					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**Introduces basic concepts of DTP, Components of PageMaker and introduce different options in word processing for creating and editing documents and PowerPoint for creating and editing presentation.**					
Course Outcomes (CO)						
CO1	Understand and apply common features of DTP and PageMaker					
CO2	Understand to create and edit publications in PageMaker					
CO3	Implement different options in word processing for creating and editing documents.					
CO4	Iimplement different options in PowerPoint for creating and editing presentation.					

BCA-125	Structured System Analysis and Design					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Analyze and specify the requirements of a system.					
CO2	Design system components and environments.					
CO3	Analyze general and detailed models that assist programmers in implementing a system.					
CO4	Analyze database for storing data, a user interface for data input and output, and controls to protect the system and its data.					

Course Title: Software Lab **Course No. BCA-131**

Course Outcomes	
CO1	Understand arrays, it's declaration and uses.
CO2	Understand the format of functions and their application in solving complex problems.
CO3	Understand the declaration of pointers, their use, their arithmetic and applications with arrays, structures, functions and strings.
CO4	Understand and implement structures, union and various macros constructs.

Course Title: Software Lab **Course No. BCA-132**

Course Outcomes	
CO1	Understand to manage hardware and software in Windows.
CO2	Implement different options in spreadsheet for creating and editing worksheets.
CO3	Implement options for creating and edit publications in PageMaker

CO4	Implement different options in word processing and power point for creating and editing documents.

BCA Semester-II							
Paper	**Lecture**	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
Mathematic Foundations –II	**6**	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**

B.C.A. Semester-II

Paper- BCA-123 Mathematical Foundations-II
Upon completion of this course, to be able to:

CO 1: To understand the concept of relations and functions and measure of Dispersion.

CO 2: To understand the concept of partial derivatives and three dimensional geometry and know about different types of distributions.

CO 3: To estimate different distributions and to understand and evaluate double and triple integrals

CO 4: To learn about how to conduct hypothesis Testing, methods of studying Correlation and tests of significance.

Semester-III

BCA – 231	**OBJECT ORIENTED PROGRAMMING USING 'C++'**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**

Course Outcomes	
CO1	Understand and apply the basic concepts of object-oriented programming language and their representation.
CO2	Implement the dynamic memory allocation functions, access specifier and the behavior of inheritance and its implementation.
CO3	Understand and deploy the use of constructors and destructors.
CO4	Understand and implement polymorphism, interface design and overloading of operators.
CO-5	Apply the I/O operations to handle backup system using file and to develop general purpose templates.

BCA-232	Data Structures					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Course Outcomes (CO)						
CO1	To implement and analyze algorithms and algorithm correctness.					
CO2	To be able to describe stack, queue and linked list data structures.					
CO3	To implement linear and non-linear data structures.					
CO4	Ability to have knowledge of tree and graph concepts.					

BCA-233	COMPUTER ARCHITECTURE					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Course Outcomes (CO)						
CO1	To understand the functional units of a processor such as the register file and arithmetic-logical unit with the basics of System.					
CO2	To identify different types of Computer Organization and various addressing modes.					
CO3	To analyze the CPU design including the RISC/CISC architectures.					
CO4	To implement the basic knowledge of I/O devices and interfacing of I/O devices with computer.					
CO5	To understand the Direct Memory Access Transfer and CPU-IOP communication.					
CO6	To Explain and Summarize Asynchronous Serial Transfer.					

BCA-234	Software Engineering					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	Software engineering is an engineering branch associated with development of software product using well-defined scientific principles, methods and procedures. The outcome of software engineering is an efficient and reliable software product.					
Course Outcomes (CO)						
CO1	Apply the concept of the software process models according to user requirement.					
CO2	Understand the fundamental concept of requirements techniques and Analysis Modelling.					
CO3	Understand the different design techniques (Cohesion and Coupling) and their implementation.					
CO4	Design various software reliability measures to access the quality of software in case of various faults and failure.					
CO5	Develop various testing methodologies and maintenance model.					

BCA-235	Fundamentals of Database System					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**Introduces basic concepts of Database Management System, architecture of DBMS, models used in database along with ER Diagrams**					
Course Outcomes (CO)						
CO1	Explain the basic concepts and the applications of database systems					
CO2	Understand the three level architecture of DBMS.					
CO3	***Identify*** the basic concepts and various data model used in database design					
CO4	Design ER-models to represent simple database application scenarios.					
CO5	Explain the basic concepts of relational data model					

BCA Semester-III							
Paper	**Lecture**	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
Computer Oriented Numerical Methods	**6**	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**

B.C.A. Semester-III

Paper- BCA-236 Computer Oriented Numerical Methods

Upon completion of this course, to be able to:

CO 1: To understand the concept of computer Arithmetic, Newton Raphson method Iteration method

CO 2: To find solution of differential equations with the help of Gauss method, Runga–Kutta methods and Euler method.

CO 3: To understand the concept of Interpolation and approximation

CO 4: To understand the concept of numerical differentiation and integration and floating-point representation.

CO 5: To find solution of simultaneous linear equations and ordinary differential equations and Interpolation and Approximation.

Semester-IV

BCA-241	Advance Data Structures					
Lecture	**Tutorial**	**Practical**	**External**	**Internal**	**Total**	**Time**
6	-	**-**	**80**	**20**	**100**	**3 Hrs.**
	Course Outcomes (CO)					
CO1	Demonstration of familiarity with algorithms for understanding the abstract properties of various data structures and reorganization of their advantages and disadvantages.					
CO2	Analyze and solve problems related to Arrays and Strings.					
CO3	Understand and implement the stacks and queues in solving problems of searching, sorting.					
CO4	Learn and apply various kinds of trees applications in computer science and to know about height balanced trees and application of trees					
CO5	Apply the Graph and various searching and sorting algorithms along with hash functions in faster access of information.					

BCA-242	ADVANCED PROG. USING C++					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**To familiarize the students with the basics of ADVANCED PROG. USING C++**					
Course Outcomes						
CO1	To describe the concept of function and operator overloading, virtual functions and polymorphism.					
CO.2	To perform conversion between different classes and objects.					
CO3	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.					
CO4	Demonstrate a thorough understanding of stream input/output for both console and binary files.					

BCA-243	E-Commerce					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**Analysis and evaluate thee commerce model along with the concepts e Governance and Emerging Technologies in E Commerce**					

Course Outcomes (CO)	
CO1	Understand and deploy the importance of Internet, web apps, features and elements in E Commerce to boost up the traditional venture across the globe.
CO2	Understand various types of E-commerce in market i.e., B2B, B2C, C2C, C2B.
CO3	Analyze difference between Governance and E governance.
CO4	Understand the way to explore various sectors i.e. Tourism, Share market, E - Banking, and etc.
CO5	Understand the emerging E- Commerce scenario in India

BCA-244	**RDBMSs**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**To familiarize the students with the basics of RDBMSs**					
Course Outcomes						
CO1	Understand relational database theory.					
CO2	Apply relational algebra expression, tuple and domain relation expression for queries					
CO3	Apply the concept of normalization and functional dependency.					
CO4	Apply SQL queries on data using basic DDL, DML and DCL commands.					
CO5	Understand the concept of views, group and aggregate functions.					
CO6	Apply PL/SQL programming for simple applications					

BCA-246	**Management Information System**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**Introduces basic concepts of Information System, different levels of management, different phases of developing a system and functional MIS.**					
Course Outcomes (CO)						
CO1	Understand the basic principles and working of information technology.					
CO2	Describe the role of information technology and information systems in business.					
CO3	Develop data analyzing skills to evaluate the information.					
CO4	Get an insight on characteristics, components and requirements of decision making and support system.					
CO5	Design, implement and evaluate basic information system.					
CO6	Understand the various functional information systems.					

BCA Semester-IV							
Paper	**Lecture**	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**

Computer Oriented Statistical Methods	**6**	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**

B.C.A. Semester-IV

Paper- BCA-236 Computer Oriented Statistical Methods

Upon completion of this course, to be able to:

CO 1: To understand the concept of computer Arithmetic mean, Geometric mean.

CO 2: To be familiar with Measure of Dispersion.

CO 3: To understand the concept of distributions like Binomial, Poisson, and normal distribution.

CO 4: To understand the concept of significance of test like Z-Test, T-Test, Chi-Square Test.

CO 5: To find the meaning of Anova and its importance.

BCA-251	**LAB-1**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**0**		**80**	**20**	**100**	**3 Hrs.**
Course Outcomes (CO)						
CO1	**To Deploy the basic concepts of object-oriented programming language and their representation.**					
CO2	**To Implement the dynamic memory allocation functions, access specifier and the behavior of inheritance and its implementation.**					
CO3	**Understand and Implement the use of constructors and destructors.**					
CO4	**To implement polymorphism, interface design and overloading of operators.**					
CO5	**Apply the I/O operations to handle backup system using file and to develop general purpose templates.**					
CO6	**To take practical experience of Handling raised exception while implementing various object-oriented concepts.**					

BCA-252	**LAB-II**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**0**		**80**	**20**	**100**	**3 Hrs.**

Course Outcomes	
CO1	To Deploy the basic concepts of object-oriented programming language and their representation.
CO2	To Implement the dynamic memory allocation functions, access specifier and the behaviour of inheritance and its implementation.
CO3	Understand and Implement the use of constructors and destructors.
CO4	To implement polymorphism, interface design and overloading of operators.
CO5	Apply the I/O operations to handle backup system using file and to develop general purpose templates.
CO6	To take practical experience of Handling raised exception while implementing various object-oriented concepts.

Semester-V

BCA-351	**Web Designing Fundament5als**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Course Outcomes						
CO1	Understand the basic concepts of information and web architecture.					
CO2	Analyze and apply the role of languages like HTML in the workings of the web and web applications					
CO3	Understand the skills that will enable to design and build high level web enabled Applications.					
CO4	Understand, analyze and create web pages using HTML, DHTML and Cascading Styles sheets.					

BCA-352		
Lecture	**Tutorial**	**Practical**
6	**-**	**-**
Purpose	**To familiarize the students with the basics of Operating Systems**	
Course Outcomes		
CO1	Understand the basics of operating systems like kernel, shell, types and views of operat	
CO2	Analyze Process management and various CPU scheduling algorithms.	
CO3	Implement the concept of Deadlock and its management.	
CO4	Understand various memory management techniques and concept of thrashing.	
CO5	Implementation of demand paging using virtual memory and various page replacement	

CO6	Understand file system interface, protection and security mechanisms.

BCA-353	**Artificial Intelligence**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**To familiarize the students with concepts of Artificial Intelligence.**					
Course Outcomes						
CO1	To understand the fundamentals of Artificial intelligence and problem-solving using resolution.					
CO2	To understand and apply different ways of representing knowledge in expert system.					
CO3	To learn and implement different search strategies and their properties.					
CO4	To gain insights of architecture and components of Expert System.					
CO5	To analyze and implement different learning strategies of Expert System.					
CO6	To understand the purpose and applicability of NLP.					

BCA-354	**COMPUTER NETWORKS**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Course Outcomes						
CO1	Understand the basic concept of networking, types, networking topologies and layered architecture.					
CO2	Understand the basics of data link layer and MAC sub-layer`					
CO3	Understand the network Layer functioning					
CO4	Analyze the different types of network devices and their functions within a network					

BCA-355	**Programming Using visual basic**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**To familiarize the students with concepts of visual Basic.**					
Course Outcomes						
BCA-355.1	Compare different programming Languages.					
BCA-355.2	Understand Visual Basic Integrated Development Environment.					
BCA-355.3	Apply different operations on Variables and store results.					
BCA-355.4	Understand the concept of data-driven program execution flow control in Visual Basic programming and					

	Understand loops to do repetition.
BCA-355.5	Understand additional Visual Basic controls.
BCA-355.6	Apply the concept of Functions by using call by value and call by Reference.

BCA-356	**MULTIMEDIA TOOLS**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Course Outcomes						
CO1	Identify a range of concepts, techniques and tools for creating and editing the interactive multimedia applications.					
CO2	Understand the characteristics of different media; representation of different multimedia data & its formats					
CO3	Analyze the characteristics of Human's visual system & Human's audio system; be able to take into considerations in multimedia techniques, design and implementation;					
CO4	Identify different compression standards learning different compression techniques;					
CO5	Able to design and develop multimedia systems according to the requirements of multimedia applications.					

Semester-VI

BCA-361	**Web Designing using Advancede Tools**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Design and develop the webpages with the help of DHTML, XHTML and CSS.					
CO2	Have rich knowledge of JavaScript to develop a dynamic as well as responsive website along with functionality of form validations.					
CO3	Analyze the way to design, develop and deploy sessions and cookies deliberately in ASP.					
CO4	Understand and develop the concept of XML for transferring data.					

BCA-362	**Operating System-II**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Understand Network Operating System Distributed Operating System.					
CO2	Analyze the problem of process synchronization and its solution.					
CO3	Describe and apply the problem and importance of Disk Scheduling Algorithms and Disk Management Process.					
CO4	Understand about Linux Operating System and Shell Programming.					

BCA-363	Computer Graphics					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**Introduces basics of graphics, various input/output devices works with graphics, geometric object designing algorithms, 2D and 3D transformations and viewing**					
Course Outcomes (CO)						
CO1	Analyze different graphics and display system.					
CO2	Enumerate the use of different input devices along with the applications of computer graphics.					
CO3	Apply scan conversion algorithms to design various geometric shapes.					
CO4	Illustrate different filling algorithm of basic objects and their comparative analysis.					
CO5	Understand and apply geometric transformations on graphics objects and their application in composite form.					
CO6	Extract scene with different clipping methods and its transformation to graphics display device.					

BCA-364	Internet Technologies					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**Introduces basic concepts of Internet, TCP/IP model, web protocols and working and importance of Virtual Private Network.**					
Course Outcomes (CO)						
CO1	Understand the working reference and TCP Model along with Web Apps.					
CO2	Analysis the verities of IP address to identify devices on internet.					
CO3	Knowledge about the web protocols.					
CO4	Understand the importance and working of Virtual Private Network.					

BCA-365	Advanced Programming with Visual basic					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**-**	**-**	**80**	**20**	**100**	**3 Hrs.**
Purpose	**To familiarize the students with concepts of adv visual Basic.**					
Course Outcomes						
CO1	Apply different methods and events of form.					
CO2	Understand and Apply the concept of Collection.					
CO3	Create menu driven applications using visual basic					
CO4	Apply the concept of Random Access files and Sequential files.					
CO5	Implement databases with various data controls.					

BCA-366	PROGRAMMING IN CORE JAVA					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
6	**0**		**80**	**20**	**100**	**3 Hrs.**
	Course Outcomes					
CO1	Understand and apply the basic concepts of object-oriented programming language and their representation.					
CO2	Implement the dynamic memory allocation functions, access specifier and the behavior of inheritance and its implementation.					
CO3	Learn and implement use of constructors and destructors.					
CO4	Understand and implement polymorphism, interface design and overloading of operators.					
CO5	Apply the I/O operations to handle backup system using file and to develop general purpose templates.					
CO6	Handle raised exception while implementing various object-oriented concepts.					

BCA-371 Lab	
CO1	Understand the basics of information and web architecture.
CO2	Design web pages using HTML, DHTML and Cascading Styles sheets.
CO3	Analyse JavaScript to enable an interaction between the users and a machine along with functionality of form validations.
CO4	Understand and develop the concept of XML for transferring data.

BCA-372 lab	
Course Outcomes (CO)	
CO1	Understand and implement Basic controls of visual basic.
CO2	Understand and implement various control structures and the concept of functions.
CO3	To create Menu driven Applications.

CO4	Apply the concept of Sequential and Random-access files.
CO5	Apply the concept of databases with the help of various Data controls.

PROGRAM: BACHELOR OF COMPUTER SCIENCE (B.SC (CS))

PROGRAMME OUTCOMES (POS)

On successful completion of Graduate Program, Graduating Students/ Graduates will be able to:

PO 1	Provide students with fundamental knowledge and ability to expertise in Computer Science.
PO 2	Provide insight to problem solving to succeed in Technical Profession through precise education and to prepare students to excel in postgraduate programs.
PO 3	To inculcate in students professional, effective communication skills, team work, multidisciplinary approach and an ability to relate issues to broader social context.
PO 4	Prepare students to be aware of excellence, leadership, written ethical codes and guidelines and lifelong learning needed for successful professional career by providing them with an excellent academic environment.
PO 5	Empower the students in academic, social, psychological and economic arenas by developing relevant competencies.
PO 6	Interpret and apply the implications of environment awareness initiatives incorporated in curriculum.
PO 7	Participation and contribution to community development activities through NCC, NSS etc.
PO 8	Acquire sufficient knowledge base in the Domain Specific area leading to the pursuit of advanced level of study in the chosen Domain Specific area.

PO9	Adaptabilityandcapacitybuildingtotheeverchangingneedsoftheindustryand employment opportunities.
PO10	Inculcate the human values through curricular, co-curricular and extra curricular activities.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

The Department of Computer Science S.U.S. Govt. College, Matak Majri, Karnal offers Three Year (comprising 6 semesters) Undergraduate Program in Computer Science with objective of empowering students to acquire all-inclusive understanding of Computer Knowledge both theoretical and practical as an academic discipline. Upon completion of B.Sc. Computer Science Degree Program successfully, the students shall acquire the following skills and competencies.

PSO1	Ability to apply foundations of Mathematics, Principles of Physics/Statistics and Theory of Computer Science in solving the real-world problems.
PSO2	Identify, formulate, review research literature, and analyzes complex problems reaching substantiated conclusions using first principles of mathematics and Computer science.
PSO3	Design solutions for complex problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PSO4	Create, select, and apply appropriate techniques, resources, and modern IT tools including prediction and modeling to complex activities with an understanding of the limitations.

Course Out comes of Computer Science Courses in B.Sc

Semester-I

Paper-1	Computer And Programming Fundamentals					
Lecture	Tutorial	Practical	Major Test	Minor Test	Total	Time
3	-	-	40	10	50	3 Hrs.
Course Out comes(CO)						

CO1	Know the basic components of computer and functionality of each components of computer.
CO2	To Design algorithm, flowchart and decision table.
CO3	To Know the difference between assembler, compiler and interpreter
CO4	To Know about the various types of memory used in the computer system and Understand the functions of Operating system
CO5	Understand different types of searching, sorting and merging algorithm

Paper-II	**PC software**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**-**	**-**	**40**	**10**	**50**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Understand the basic concept and functioning of an Operating system and to Know the basic features of MS Word					
CO2	Understand the concept of mail merge, hyperlink, book mark, tables and macros in MSWord.					
CO3	Understand the concept of worksheet and to Design the worksheets using different formulas and functions.					
CO4	Under the concept of PowerPoint presentation.					
CO5	Understand how to add different animations and sound effects in a presentation.					

Semester-II

Paper-I	**Programming in C**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**-**	**-**	**40**	**10**	**50**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Understand the fundamentals of C programming language.					
CO2	Choose the loops and decision making statements to solve the various programming problems					
CO3	Understand the concept of various types of data handling techniques.					
CO4	Use of modular approach to solve the complex problem					
CO5	Understand the concepts of storage classes and to Know about to use recursion to solve the problem in an efficient manner.					

Paper-II	**Logical organization of computers**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**-**	**-**	**40**	**10**	**50**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Understand different number systems, Coding techniques, Logic gates, Boolean algebra. • Solve the problem using K-Map.					
CO2	Understand different types of sequential and combinational logic					
CO3	Design and implement different types of Registers, counters, multiplexers, demultiplexers					
CO4	Design and implement different types of Registers, counters, multiplexers, demultiplexers.					

	and to Understand adder, subtractor, Comparators and code convertors.
CO5	Understand different coding techniques. • Designing truth tables for different circuits.

Semester-III

Paper-I	**Data structures**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**-**	**-**	**40**	**10**	**50**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Know the basic components of computer and functionality of all data structures. Learn how to store string in a computer					
CO2	Study the concepts and utilization of arrays, different Storage Classes					
CO3	Understand the purpose of different data structures					
CO4	Learn to use Stack, Queue and Linked List.					
CO5	Understand Searching, Sorting and merging algorithm					

Paper-II	**Software Engineering**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**-**	**-**	**40**	**10**	**50**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Understand the basic concept of Software engineering and various matrices to evaluate the parameters.					
CO2	Learn various models for the solution of a problem					
CO3	Understand the various life cycles in process of software development.					
CO4	Learn about the importance of specifications and Feasibility Study.					
CO5	Study the role of system analyst in designing software.					

Semester-IV

Paper-I	**Programming in C++**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**-**	**-**	**40**	**10**	**50**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Understand the Basic concepts of object oriented programming languages..					
CO2	Studies concepts of OOPs in C++ like classes, inheritance, polymorphism, and Encapsulation, operators.					

CO3	Learn how operators can be modified to perform various user defined operations by using operator overloading.
CO4	Understand the concepts of storage classes and scope of variables.
CO5	Understand the concepts of objects and pointers and functional overloading to create uniform plate-form for the same type of functions.

Paper-II	**Operating System**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**-**	**-**	**40**	**10**	**50**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Understand concepts of different types of operating system					
CO2	Learn the various methods to achieve multiprogramming environment.					
CO3	Understand the concepts of CPU Scheduling.					
CO4	Study how different CPUs work together in multiprocessor environment.					
CO5	Understand how can we prevent and recover from a deadlock.					
CO6	Understand the various methods of process synchronization.					

Semester-V

Paper-I	**Fundamentals of Database Systems**					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**-**	**-**	**40**	**10**	**50**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Have a broad understanding of database concepts & DBMS.					
CO2	Have a high- level understanding of major DBMS components & their function.					
CO3	Be able to model an application data requirements using conceptual modelling tools like ER diagrams & design database schemas based on the conceptual model.					
CO4	They can analyze a problem & identify &define the computing requirements appropriate to its solution					

Paper-II	Web Designing					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**-**	**-**	**40**	**10**	**50**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Create an information architecture document for a website.					
CO2	Construct a website that conforms to the web standards of today..					
CO3	Publish the website to a remote server using FTP.					
CO4	Select & use appropriate technology tools to efficiently & effectively complete a task or project					

Semester-VI

Paper-I	Relational Database Management System					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**-**	**-**	**40**	**10**	**50**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Understand & effectively explain the underlying concepts of database technologies.					
CO2	Design & implement a database schema for a given problem- domain. And Normalize a database. .					
CO3	Populate & query a database using SQL DML/DDL commands. And Declare & enforce integrity constraints on a database using RDBMS					
CO4	Programming PL/SQL including stored procedures & functions.					

Paper-II	Computer Networks					
Lecture	**Tutorial**	**Practical**	**Major Test**	**Minor Test**	**Total**	**Time**
3	**-**	**-**	**40**	**10**	**50**	**3 Hrs.**
Course Outcomes (CO)						
CO1	Build an understanding of the fundamental concepts of Computer networking					
CO2	Familiarize the student with the basic taxonomy & terminology of the Computer networking area. .					
CO3	Introduce to advanced networking concepts, prepare the student for entry Advanced courses in Computer networking					
CO4	Understand & building the skills of sub netting & routing mechanisms.					
CO5	Have familiarity with the basic protocols of Computer networks & how they can be used to assist in network design & implementation.					