Rajeev Gandhi Govt. Post Graduate College Ambikapur Chhattisgarh

DEPARTMENT OF COMPUTER SCIENCE

Programme Outcome (PO), Course Outcome (CO) and CO-PO Mapping

Programme: M.Sc. Computer Science

PROGRAMME OUTCOMES (POs)	
On successful completion of the M.Sc. Computer Science program:	
PO1	**Discipline knowledge:** Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity.
PO2	**Problem Solving:** Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
PO3	**Design and Development of Solutions:** Ability to design and development of algorithmic solutions to real world problems and acquiring a minimum knowledge on statistics and optimization problems. Establishing excellent skills in applying various design strategies for solving complex problems
PO4	**Programming a Computer:** Exhibiting strong skills required to program a computer for various issues and problems of day-to-day applications with through knowledge on programming languages of various levels.
PO5	**Application Systems Knowledge:** Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.
PO6	**Modern Tool Usage:** Identify, select and use a modern scientific and IT tool or technique for modeling, prediction, data analysis and solving problems in the area of Computer Science and making them mobile based application software.
PO7	**Industry Familiar:** Student will be able to become industry familiar.
PO8	**Project Management:** Practicing of existing projects and becoming independent to launch own project by identifying a gap in solutions.
PO9	**Ethics on Profession, Environment and Society:** Exhibiting professional ethics to maintain the integrality in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
PO10	**Motivation to take up Higher Studies:** Inspiration to continue educations towards advanced studies on Computer Science.

M.Sc. Semester-I (Computer Science)

Paper-I: Data Structure and Algorithm Implementation

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of data structure and its tools and techniques

CO2: Gain knowledge and evaluate the graph theory, searching data items and traversal technique in various data structure.

CO3: Analyze the basic operation of various data structures.

CO4: Understand the working of tree, queue, stack, link list, array and structure.

CO5: Design and analyze minimum traversal cast between tree, link list and queue

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓			✓			✓			✓
CO2		✓			✓		✓		✓	
CO3	✓		✓					✓		✓
CO4	✓	✓			✓	✓	✓			✓
CO5	✓	✓		✓		✓			✓	✓

Paper-II: HTML and Web Design

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of Website development and its features.

CO2: Gain knowledge of the HTML and related tags.

CO3: Analyze the basic operation of web pages.

CO4: Understand the web related CSS, protocols, and other web servers.

CO5: Design Websites and its hosting process.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓				✓	✓
CO2	✓					✓	✓			
CO3	✓	✓					✓			
CO4	✓	✓			✓	✓	✓			✓
CO5	✓	✓	✓		✓			✓	✓	✓

Paper-III: Programming in C: Core and Advanced

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of programming logic its basic tools.

CO2: Gain knowledge of the C programming Language.

CO3: Analyze the basic operation of data structure.

CO4: Understand the various data types and structures, functions, looping and decision statements.

CO5: Design develops and run programs.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓				✓	
CO2	✓				✓				✓	✓
CO3	✓	✓	✓	✓	✓		✓	✓		
CO4	✓	✓	✓	✓		✓				✓
CO5	✓	✓				✓	✓			✓

Paper-V: Fundamental of Information Technology

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of programming logic its basic tools. Acquire knowledge of Computer hardware and software.

CO2: Gain knowledge of the basic architecture of computer system and its devices.

CO3: Analyze the basic operation of CPU, Memory, and other devices.

CO4: Understand the various operating systems, generations, types and classification of computersystems.

CO5: Understand and analyze the basic terminology of network, Internet, IT Trends.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓									
CO2	✓				✓		✓		✓	✓
CO3	✓								✓	
CO4	✓	✓		✓			✓		✓	✓
CO5	✓	✓	✓		✓		✓			✓

Paper-V: Numerical Analysis in Computer Application

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Demonstrate competence with understanding the theoretical and practical aspects of the use of numerical methods.

CO2: Establish the limitations, advantages and disadvantages of different numerical methods.

CO3: Identify and interpret the fundamental concepts of polynomial and roots of equations, Finite differences, Eigen values and Eigen vectors and corresponding algorithms.

CO4: Develop skills in analyzing the methods of interpolating a given data, properties of interpolation with unequal intervals and derive conclusions, approximate a function using an appropriate numerical method.

CO5: Analyze the physical problems to establish mathematical model and use appropriate method to solve and optimize the solution.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓									
CO2	✓				✓		✓		✓	✓
CO3	✓								✓	
CO4	✓	✓		✓			✓		✓	✓
CO5	✓	✓	✓		✓		✓			✓

Paper-V: Database Design Techniques

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of DBMS and its basic concepts.

CO2: Gain knowledge of the PL/SQL and its scripting technique.

CO3: Analyze the basic operation of DBMS objects.

CO4: Understand the DDL, DML and Other Language.

CO5: Analyze, develop and run programs.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓			✓		✓				
CO2	✓		✓		✓					✓
CO3	✓	✓	✓		✓		✓	✓	✓	
CO4	✓	✓					✓			✓
CO5	✓	✓	✓	✓		✓			✓	✓

M.Sc. Semester-II (Computer Science)

Paper-I: Operating System Concepts

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of various types and function of operating systems.

CO2: Gain knowledge of the basic architecture of operating system and various tools.

CO3: Analyze the basic operation of operating system.

CO4: Understand the various techniques of memory management, process management and controlling input output operations.

CO5: Analyze the performance of different scheduling algorithms along with the policies for concurrency and deadlock management.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓		✓		✓			✓	✓	✓
CO2	✓		✓	✓	✓		✓			✓
CO3	✓	✓	✓	✓	✓		✓		✓	✓
CO4	✓	✓					✓		✓	✓
CO5	✓			✓				✓		

Paper-II: Object Oriented Programming Concepts in C++

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of OOPS.

CO2: Gain knowledge of the basic terminology of OOPS.

CO3: Analyze the basic operation of inheritance, polymorphism, classes and objects.

CO4: Understand the various techniques and development environment of OOPS.

CO5: Design a OOPS based program or software.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓				✓	
CO2	✓				✓				✓	✓
CO3	✓	✓	✓	✓	✓		✓	✓		
CO4	✓	✓	✓	✓		✓				✓
CO5	✓	✓				✓	✓			✓

Paper-III: Web Technology: Based on ASP.NET

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of various types of cloud computing systems and .net frameworks.

CO2: Gain knowledge of the development of dynamic website.

CO3: Analyze the basic operation of asp.net pages and its tools.

CO4: Understand the various development techniques, hosting sites and web sites.

CO5: Design a complete web enables sites.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓				✓	
CO2	✓				✓				✓	✓
CO3	✓	✓	✓	✓	✓		✓	✓		
CO4	✓	✓	✓	✓		✓				✓
CO5	✓	✓				✓	✓			✓

Paper-IV: Research Methodology & Computer Application: Basics

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Gets acquainted with various resources for research.

CO2: Becomes familiar with various tools of research. .

CO3: Gets conversant with sampling techniques, methods of research and techniques of analysis of data.

CO4: Achieves skills in various research writings.

CO5: Gets acquainted with computer Fundamentals and Office Software Package.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓				✓	✓
CO2	✓					✓	✓			
CO3	✓	✓					✓			
CO4	✓	✓			✓	✓	✓			✓
CO5	✓	✓	✓		✓			✓	✓	✓

Paper-V: Computer System Organization and Architecture

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of basic computer organization and architecture. .

CO2: Gain Knowledge about pipeline and memory hierarchy. .

CO3: Analyze & learning with Parallel Computer Models & Program parallelism.

CO4: Understand the importance of Synchronous parallel processing.

CO5: Understand the implementation of System Interconnection.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓				✓	✓
CO2	✓					✓	✓			
CO3	✓	✓					✓			
CO4	✓	✓			✓	✓	✓			✓
CO5	✓	✓	✓		✓			✓	✓	✓

Paper-V: Discrete Mathematics

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of basic mathematics.

CO2: Gain knowledge statements, connectives, quantifiers.

CO3: Analyze & learning with proposition and Boolean algebra.

CO4: Understand the importance of Boolean functions & its environment. .

CO5: Design & Analyze the basic Graph theories & trees.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓				✓	✓
CO2	✓					✓	✓			
CO3	✓	✓					✓			
CO4	✓	✓			✓	✓	✓			✓
CO5	✓	✓	✓		✓			✓	✓	✓

M.Sc. Semester-III (Computer Science)

Paper-I: Advanced Java Programming

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Use an integrated development environment to write, compile, run and test simple object-oriented Java programs.

CO2: Identify classes, objects, members of a class and relationships among them needed for a specific problem.

CO3: Write Java application programs using OOP principles and proper program structuring.

CO4: Demonstrate the concepts of polymorphism and inheritance.

CO5: Write java programs to implement error handling techniques using exception handling.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓				✓	
CO2	✓				✓				✓	✓
CO3	✓	✓	✓	✓	✓		✓	✓		
CO4	✓	✓	✓	✓		✓				✓
CO5	✓	✓				✓	✓			✓

Paper-II: Data Communication & Computer Networks

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Understand the concepts of Data Communication.

CO2: Study the functions of OSI Layers.

CO3: Familiarize with the Transmission Media, Flow control, Error detection & correction.

CO4: Understand fundamental concepts in Routing, Addressing & working of Transport Protocols.

CO5: Describe, analyze and compare different data link, network, and transport and application layer protocols.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓		✓		✓			✓	✓	✓
CO2	✓		✓	✓	✓		✓			✓
CO3	✓	✓	✓	✓	✓		✓		✓	✓
CO4	✓	✓					✓		✓	✓
CO5	✓			✓				✓		

Paper-III: RDBMS

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of basic Database design.

CO2: Gain Knowledge about Relational Model.

CO3: Analyze & learning with Database design concept.

CO4: Understand the importance of Normal forms.

CO5: Understand the implementation of Transaction Processing techniques.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓			✓		✓				
CO2	✓		✓		✓					✓
CO3	✓	✓	✓		✓		✓	✓	✓	
CO4	✓	✓					✓			✓
CO5	✓	✓	✓	✓		✓			✓	✓

Paper-IV: Intellectual Property Rights

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Distinguish and explain various forms of IPRs.

CO2: Identify criteria's to fit one's own intellectual work in particular form of IPRs.

CO3: Apply statutory provisions to protect particular form of IPRs.

CO4: Analyze ethical and professional issues which arise in the intellectual property law context.

CO5: Understand current and emerging issues relating to the intellectual property protection.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓			✓		✓				
CO2	✓		✓		✓					✓
CO3	✓	✓	✓		✓		✓	✓	✓	
CO4	✓	✓					✓			✓
CO5	✓	✓	✓	✓		✓			✓	✓

Paper-V: Theory of Computation & Automata

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire basic knowledge of Theory of computation.

CO2: Gain Knowledge about Automata theory and its applications.

CO3: Analyze & learning with Regular expression.

CO4: Understand the importance of Context–free grammars.

CO5: Understand the working of Turing machine and computers.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓				✓	✓
CO2	✓					✓	✓			
CO3	✓	✓					✓			
CO4	✓	✓			✓	✓	✓			✓
CO5	✓	✓	✓		✓			✓	✓	✓

Paper-V: Artificial Intelligence and Expert System

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire overview of basic Artificial Intelligence.

CO2: Gain Knowledge about problem solving and search strategies.

CO3: Analyze & learning with structured knowledge & its basic terminology.

CO4: Understand the importance of knowledge representation and Expert System.

CO5: Understand the implementation of Planning and Neural Network.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓						✓		✓	
CO2	✓	✓			✓	✓			✓	✓
CO3	✓		✓		✓	✓				✓
CO4	✓		✓	✓	✓	✓	✓	✓		✓
CO5	✓	✓	✓	✓		✓	✓	✓	✓	✓

M.Sc. Semester-IV

Paper-I: Network Security

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Acquire basic knowledge of network security.

CO2: Gain knowledge about Conventional and Encryption Principles.

CO3: Understanding Key exchanges.

CO4: Describe the various Digital signatures logic.

CO5: Apply different encryption and decryption techniques.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓						✓		✓	
CO2	✓	✓			✓	✓			✓	✓
CO3	✓		✓		✓	✓				✓
CO4	✓		✓	✓	✓	✓	✓	✓		✓
CO5	✓	✓	✓	✓		✓	✓	✓	✓	✓

Paper-II: Mobile Computing and Application Development

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Explain the basic concepts of wireless network and wireless generations.

CO2: Demonstrate the different wireless technologies such as CDMA, GSM, GPRS, etc.

CO3: Describe and judge the emerging wireless technologies standards such as WLAN, WMAN.

CO4: Explain the design considerations for deploying the wireless network infrastructure.

CO5: Differentiate and support the security measures standards.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓						✓		✓	
CO2	✓	✓			✓	✓			✓	✓
CO3	✓		✓		✓	✓				✓
CO4	✓		✓	✓	✓	✓	✓	✓		✓
CO5	✓	✓	✓	✓		✓	✓	✓	✓	✓

Paper-III: System Design and Software Engineering

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Able to understand the principles and tools of systems analysis and design.

CO2: Able to understand the SDLC of system development in different context.

CO3: Understand and apply various software metrics on software quality products.

CO4: Perform software testing on various applications.

CO5: Able to understand the professional and ethical responsibilities system implementation and software documentation.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓		✓	✓			✓		✓	✓
CO2	✓		✓		✓		✓			✓
CO3	✓	✓	✓	✓	✓		✓	✓		
CO4	✓				✓	✓			✓	✓
CO5	✓	✓		✓		✓	✓	✓		✓

Paper-IV: Dissertation

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Discover potential research areas in the field of IT.

CO2: Conduct a survey of several available literatures in the preferred field of study.

CO3: Compare and contrast the several existing solutions for research challenge.

CO4: Formulate and propose a plan for creating a solution for the research plan identified.

CO5: To report and present the findings of the study conducted in the preferred domain.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓						✓		✓	
CO2	✓	✓			✓	✓			✓	✓
CO3	✓		✓		✓	✓				✓
CO4	✓		✓	✓	✓	✓	✓	✓		✓
CO5	✓	✓	✓	✓		✓	✓	✓	✓	✓

Paper-V: Cyber Crime and Security Fundamental

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Develop a deeper understanding for various types of cyber attacks, cyber crimes, vulnerabilities and remedies thereto.

CO2: Analyze and evaluate existing legal framework and laws on cyber security.

CO3: Analyze and evaluate the importance of personal data its privacy and security.

CO4: Able to take measures for self-cyber-protection as well as societal cyber-protection.

CO5: Get insights into risk-based assessment, requirement of security controls and need for cyber security audit and compliance.

CO-PO MAPPING

CO	PO									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	✓				✓	✓		✓		✓
CO2	✓	✓					✓		✓	✓
CO3	✓	✓	✓				✓		✓	✓
CO4	✓	✓	✓	✓			✓		✓	✓
CO5		✓		✓				✓	✓	

Programme: B.Sc (Computer Science) NEP

PROGRAMME OUTCOMES (POs)	
PO1	**Discipline knowledge:** Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity.
PO2	**Problem Solving:** Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
PO3	**Design and Development of Solutions:** Ability to design and development of algorithmic solutions to real world problems and acquiring a minimum knowledge on statistics and optimization problems. Establishing excellent skills in applying various design strategies for solving complex problems
PO4	**Programming a Computer:** Exhibiting strong skills required to program a computer for various issues and problems of day-to-day applications with through knowledge on programming languages of various levels.
PO5	**Application Systems Knowledge:** Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.
PO6	**Modern Tool Usage:** Identify, select and use a modern scientific and IT tool or technique for modeling, prediction, data analysis and solving problems in the area of Computer Science and making them mobile based application software.
PO7	**Industry Familiar:** Student will be able to become industry familiar.
PO8	**Project Management:** Practicing of existing projects and becoming independent to launch own project by identifying a gap in solutions.
PO9	**Ethics on Profession, Environment and Society:** Exhibiting professional ethics to maintain the integrality in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
PO10	**Motivation to take up Higher Studies:** Inspiration to continue educations towards advanced studies on Computer Science.

B.Sc. Semester-I

DSC CS01- Introductory Computer Science (Course type: Discipline Specific Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of basic computer technology.

CO2: Gain Knowledge about H/w and S/w Concepts with its technology areas.

CO3: Understand the basics of programming languages.

CO4: Analyze & learning with C-Programming & its basic terminology.

CO5: Design & Analyze the basic terminology of network, communications etc.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓									
CO2	✓				✓		✓		✓	✓
CO3	✓								✓	
CO4	✓	✓		✓			✓		✓	✓
CO5	✓	✓	✓		✓		✓			✓

GE CS01- Basics of Computer Science (Course type: Generic Elective Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:
CO1: Acquire knowledge of basic computer Technology.
CO2: Gain Knowledge about hardware and software concepts.
CO3: Understand the working of various application software.
CO4: Understand the working of Language translators.
CO5: Design & Analyze the basic terminology of network, Internet, communications etc.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓									
CO2	✓				✓		✓		✓	✓
CO3	✓								✓	
CO4	✓	✓		✓			✓		✓	✓
CO5	✓	✓	✓		✓		✓			✓

VAC CS01- Cyber Crime & Security-I (Course type: Value Added Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Develop a deeper understanding for various types of cyber attacks, cyber crimes, vulnerabilities and remedies thereto.

CO2: Analyze and evaluate existing legal framework and laws on cyber security.

CO3: Analyze and evaluate the importance of personal data its privacy and security.

CO4: Analyze and evaluate the cyber security risks.

CO5: Able to take measures for self-cyber-protection as well as societal cyber-protection.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓	✓		✓		✓
CO2	✓	✓					✓		✓	✓
CO3	✓	✓	✓				✓		✓	✓
CO4	✓	✓	✓	✓			✓		✓	✓
CO5		✓		✓				✓	✓	

B.Sc. Semester-II

DSC CS02- Programming in C (Course type: Discipline Specific Core Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Understand the basics of programming languages.

CO2: Analyze & learning with C-Programming & its basic terminology.

CO3: Read, understand and trace the execution of programs written in C language.

CO4: Understand the implementation of Control Structure.

CO5: Understand the importance of Array, Functions, Pointer and String and File Handling.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓				✓	
CO2	✓				✓				✓	✓
CO3	✓	✓	✓	✓	✓		✓	✓		
CO4	✓	✓	✓	✓		✓				✓
CO5	✓	✓				✓	✓			✓

GE CS02- Basics of Networking & Communication Technologies (Course type: Generic Elective Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Acquire basic knowledge of computer networks & its terminology.

CO2: Gain Knowledge about LAN, MAN, WAN.

CO3: Analyze & learning with internet, intranet, extranet & its basic terminology.

CO4: Understand the importance of transmission media.

CO5: Understand the working of Network protocols and Networking devices.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓									
CO2	✓		✓		✓		✓			✓
CO3	✓	✓	✓			✓	✓		✓	✓
CO4	✓					✓	✓			✓
CO5	✓	✓			✓		✓		✓	✓

VAC CS02- Cyber Crime & Security-II (Course type: Value Added Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Develop a deeper understanding for various types of cyber attacks, cyber crimes, vulnerabilities and remedies thereto.

CO2: Understand the basic security aspects related to Computer and Mobiles.

CO3: Use basic tools and technologies to protect their devices.

CO4: Understand the main component of cyber security plan.

CO5: Get insights into risk-based assessment, requirement of security controls and need for cyber security audit and compliance.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓	✓		✓		✓
CO2	✓	✓					✓		✓	✓
CO3	✓	✓	✓				✓		✓	✓
CO4	✓	✓	✓	✓			✓		✓	✓
CO5		✓		✓				✓	✓	

B.Sc. Semester-III

DSC CS03- Data Structures (Course type: Discipline Specific Core Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Have a comprehensive knowledge of the data structures and algorithms on which file structures and data bases are based.

CO2: Understand the importance of data and be able to identify the data requirements for an application.

CO3: Have in depth understanding and practical experience of algorithmic design and implementation.

CO4: Have practical experience of implementing all kinds of data structures.

CO5: Understand the issues involved in algorithm complexity and performance.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓			✓			✓			✓
CO2		✓			✓		✓		✓	
CO3	✓		✓					✓		✓
CO4	✓	✓			✓	✓	✓			✓
CO5	✓	✓		✓		✓			✓	✓

DSE CS03- Fundamentals of Digital Logic (Discipline Specific Elective Course)

COURSE OUTCOMES:

Students, after completion of this course will be able to:

CO1: Use number systems and complements.

CO2: Understand the fundamentals of Boolean algebra and logic gates.

CO3: Identify the importance of canonical forms in the minimization or other optimization of Boolean formulas in general and digital circuits.

CO4: Minimize functions using any type of minimizing algorithms (Boolean algebra or Karnaugh map).

CO5: Analyze the design and working of Combinational and Sequential circuits.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓									
CO2	✓			✓		✓				✓
CO3	✓		✓		✓		✓		✓	✓
CO4	✓	✓			✓		✓			✓
CO5	✓	✓	✓	✓		✓	✓	✓	✓	✓

B.Sc. Semester-IV

DSC CS04- Object Oriented Programming using C++ (Discipline Specific Core Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Able to analyze a simple programming problem specification**.**
CO2: Gain Knowledge about Object Oriented Programming Language.
CO3: Design a high-level solution to the problem using functional abstraction and general imperative programming language constructs.
CO4: Understand the importance of Data binding, functions and creating objects.
CO5: Understand the concept of Pointers and memory allocation (static and dynamic).

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓				✓	
CO2	✓				✓				✓	✓
CO3	✓	✓	✓	✓	✓		✓	✓		
CO4	✓	✓	✓	✓		✓				✓
CO5	✓	✓				✓	✓			✓

DSE CS04- Operating System (Discipline Specific Elective Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Explain the structure and function of operating systems along with their components, types and working.
CO2: Understand the implementation of Operating System architecture.
CO3: Make use of appropriate Linux/Windows commands for memory management, file management and directory management.
CO4: Analyze the performance of different scheduling algorithms along with the policies for concurrency and deadlock management.
CO5: Elaborate the system calls for process management and file management.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓		✓		✓			✓	✓	✓
CO2	✓		✓	✓	✓		✓			✓
CO3	✓	✓	✓	✓	✓		✓		✓	✓
CO4	✓	✓					✓		✓	✓
CO5	✓			✓				✓		

B.Sc. Semester-V

DSC CS05- Programming in Java (Discipline Specific Core Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Use an integrated development environment to write, compile, run and test simple object-oriented Java programs.
CO2: Identify classes, objects, members of a class and relationships among them needed for a specific problem.
CO3: Write Java application programs using OOP principles and proper program structuring.
CO4: Demonstrate the concepts of polymorphism and inheritance.
CO5: Write java programs to implement error handling techniques using exception handling.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓				✓				✓	
CO2	✓				✓				✓	✓
CO3	✓	✓	✓	✓	✓		✓	✓		
CO4	✓	✓	✓	✓		✓				✓
CO5	✓	✓				✓	✓			✓

DSE CS05- Software Engineering (Discipline Specific Elective Course)

COURSE OUTCOME:

CO1: Acquire knowledge of basic Software Engineering and process model.

CO2: Gain Knowledge about Design Engineering and requirements.

CO3: Analyze & learning with Architectural design, pattern & its basic terminology.

CO4: Understand the importance of testing strategies and matrices.

CO5: Understand the implementation of Testing & techniques.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓		✓	✓			✓		✓	✓
CO2	✓		✓		✓		✓			✓
CO3	✓	✓	✓	✓	✓		✓	✓		
CO4	✓				✓	✓			✓	✓
CO5	✓	✓		✓		✓	✓	✓		✓

GE CS05- Multimedia & its Applications (Course type: Generic Elective Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Define what Multimedia is and how it works.

CO2: Understand multimedia components using various tools and techniques.

CO3: Analyze and interpret Multimedia data.

CO4: Discuss about different types of media format and their properties.

CO5: Familiarize with Internet and Multimedia.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓		✓		✓		✓			✓
CO2	✓	✓	✓		✓			✓		✓
CO3	✓	✓	✓	✓			✓	✓	✓	✓
CO4	✓				✓	✓				
CO5	✓			✓		✓			✓	✓

B.Sc. Semester-VI

DSC CS06- Database Management System (Course type: Discipline Specific Core Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Acquire knowledge of basic Database design.

CO2: Gain Knowledge about Relational Model.

CO3: Analyze & learning with Database design concept.

CO4: Understand the importance of Normal forms.

CO5: Understand the implementation of Transaction Processing techniques.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓			✓		✓				
CO2	✓		✓		✓					✓
CO3	✓	✓	✓		✓		✓	✓	✓	
CO4	✓	✓					✓			✓
CO5	✓	✓	✓	✓		✓			✓	✓

DSE CS06- Computer Networks (Discipline Specific Elective Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Understand the concepts of Data Communication.

CO2: Study the functions of OSI Layers.

CO3: Familiarize with the Transmission Media, Flow control, Error detection & correction.

CO4: Understand fundamental concepts in Routing, Addressing & working of Transport Protocols.

CO5: Describe**,** analyze and compare different data link, network, and transport and application layer protocols.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓		✓		✓			✓	✓	✓
CO2	✓		✓	✓	✓		✓			✓
CO3	✓	✓	✓	✓	✓		✓		✓	✓
CO4	✓	✓					✓		✓	✓
CO5	✓			✓				✓		

GE CS06- Fundamental Concepts of Programming (Generic Elective Course)

COURSE OUTCOME:

Students, after completion of this course will be able to:

CO1: Understand various programming paradigm.

CO2: Understand the basics of programming languages.

CO3: Analyze & learning with C-Programming & its basic terminology.

CO4: Understand the implementation of Control Structure and Array.

CO5: Familiarize with OOP's concepts.

CO-PO MAPPING

CO	PO									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	✓		✓		✓			✓	✓	
CO2		✓			✓					✓
CO3	✓						✓	✓		✓
CO4	✓	✓	✓	✓	✓					
CO5	✓		✓	✓	✓	✓	✓	✓		✓

RAJEEV GANDHI GOVT. POST GRADUATE COLLEGE AMBIKAPUR (CG)
DEPARTMENT OF COMPUTER SCIENCE
RELEVANCE(Global/National/Regional/Local)

Course Code		Course Title	Description	Relevance			
				Global	National	Regional	Local
B.Sc. I SEM	DSC CS01	Introductory Computer Science	Basics of computer, Input Out Devices,Storage Devices, Basics of Computer Network,Winodow Operating System,MS-Word, MS-Excel, MS-Power Point	✔	✔	✔	✔
	VAC CS01	Cyber Crime & Security-I	Cyber Crime Definition, Cyber law, Introduction to Cyber Security	✔	✔	✔	✔
	GE CS01	Basics of Computer Science	Introduction to computers, Memories and Computer Peripheral, Language Translator, User Interface, MS-Word, MS-Power Point	✔	✔	✔	✔
B.Sc. II SEM	DSC CS02	Programming In C	C Programming concept, Control and branch handling, Array, String, Structure, Union, Function and Pointers	✔	✔		
	VAC CS02	Cyber Crime & Security-II	Digital Devices Security, Tools and Technologies for Cyber Security, Cyber Security Management, Compliance and Governance	✔	✔	✔	✔
	GE CS02	Basics of Networking & Communication Technologies	Evolution of Networking, Terminology of Networks, Switching Techniques, Data Communication, Transmission Media, Networking Devices, Network Protocols, Internet Services, Internetworking terms	✔	✔	✔	✔
B.Sc. III SEM	DSC CS03	Data Structures	Introduction to array, Linked list, Stack, Queue, Binary Tree, Searching and Sorting, Tree, Graph.	✔	✔		
	DSE CS03	Fundamentals of Digital Logic	Background of digital network, Logic Families, Boolean Algebra, Karnaugh Maps, Combinational and Sequential Circuit and Memories.	✔	✔	✔	

Course Code		Course Title	Description	Relevance			
				Global	National	Regional	Local
B.Sc. IV SEM	DSC CS04	Object Oriented Programming Using C++	OOPs vs Procedure oriented programming, class and object, Functions in C++, Constructors, Destructors, Inheritance, Polymorphism, Exception Handling	✓	✓		
	DSE CS04	Operating System	Introduction to Opearting System, Process Management, Memory Management, File management, Device and Storage Management	✓	✓	✓	✓
B.Sc. V SEM	DSC CS05	Programming IN JAVA	OOPs feature, Inheritence, Package and Interface, Exception handling, Multithread programming, input output basic stream, Networking, Applets.	✓	✓		
	DSE CS05	Software Engineering	Introduction to SDLC, Software Requirements, Software Design and Coding, Estimation, Scheduling of Software projects.	✓	✓		
	GE CS05	Multimedia & its Applications	Introduction, Text, Images, Sound, Video, Animation, Internet and Multimedia	✓	✓	✓	✓
B.Sc. VI SEM	DSC CS06	Database Management System	Introduction to DBMS, Relational model and RDBMS, Database design and concept, Transaction processing.	✓	✓		
	DSE CS06	Computer Networks	Introduction to Computer Network, OSI Refrece Model, Various Layer, Common network architecture, Protocols	✓	✓	✓	✓
	GE CS06	Fundamental Concepts of Programming	Introduction, Language Translators, Algorithm and Flowchart, Basics of C Programming Language, OOPs concept.	✓	✓		
Sc. I SEM	MSCS 101	Data Structure and Algorithm	Array, Linked List, Stacks, Queues, Trees, Graph, Searching and Sorting	✓	✓		
	MSCS 102	HTML and Web Design	Concept of Internet, HTML, CSS, MS Expression Web, Web Publishing and Hosting	✓	✓	✓	✓
	MSCS 103	Programming In C: Core and Advanced	Fundamental knowledge of a programming language and its features which enhances the user to write general purposeapplication programs	✓	✓		

Course Code		Course Title	Description	Relevance			
				Global	National	Regional	Local
M.S	MSCS 104	Social Outreach & Internship/ Enterpreneurship	Practice ethical standards appropriate to the internship site. To understand human values, environment & sustainability	✓	✓	✓	✓
	MSCS E103	Database Design Techniques	Introduction to Database System, Relational Database Concept, Design, Database Storage and Quering, Transaction Management and Concurrency Control	✓	✓	✓	
M.Sc. II SEM	MSCS 201	Operating System Concepts	Types of Operating System, process Management, Memory Management, File and Secondary Storage Management	✓	✓	✓	✓
	MSCS 202	Object oriented Programming Concepts in C++	Principles of OOP, Function, Object and Class, Polymorphism and Inheritance	✓	✓		
	MSCS 203	Web Technology: Based on ASP.Net	Overview of the ASP.NET, Coding Standards, Master Pages and Advanced Control, SQL Server Basic, Database Access	✓	✓	✓	✓
	MSCS 221	Research Methodology & Computer Application: Basics	Concept of Research, Selection of Problem for Research, Tools of Research, Methods of Research, Treatment of Data, Writing Research Report	✓	✓	✓	✓
	MSCS E201	Computer System Organization and Architecture	Micro operation and Computer Organization, Programming Basic Computer and CPU Organization, Pipeline and Vector Processing, Input-output Organization, Memory Organization	✓	✓	✓	
	MSCS 301	Advanced Java Programming	Provides extensive programming experience with Java and its object-oriented features. Programming Skill to develop object oriented Java application and interactive event driven Applets.	✓	✓		
	MSCS 302	Data Communication & Computer Networks	Basics, Structure of data communicating systems, various algorithms, Protocols used to accomplish data transmission through internet	✓	✓	✓	✓

	Course Code	Course Title	Description	Relevance			
				Global	National	Regional	Local
M.Sc. III SEM	MSCS 303	RDBMS	File system vs DBMS, Architecture, Models,Practical applicability of Database Management System concepts, Designing of database, analysis of table design, SQL	✓	✓	✓	
	LLM 304	Intellectual Property Rights	Introduction , nature basic concepts and international conventions, Law of Copyright, Law of Patents, Law of Trade Marks, Geographical Indication and Design.	✓	✓	✓	✓
	MSCS E302	Artificial Intelligence and Expert System	Foundation , Applications and Concept of AI, Problem Solving, Knowledge Representation, Reasoning, Pattern Recognition, Expert System.	✓	✓	✓	✓
M.Sc. IV SEM	MSCS 401	Network Security	Foundation of Cryptography and Security, Symmetric Cipher, Public Key Crypography and Hash Function, IP and Web Security Protocols, System Security	✓	✓	✓	✓
	MSCS 402	Mobile Computing and Application Development	Introduction to Mobile Computing and Android, Android Activities and GUI design Concepts	✓	✓	✓	
	MSCS 403	System Design and Software Engineering	System Concepts, Tools of Structured Analysis, Software Engineering fundamentals, System design, Software Quality and Testing.	✓	✓	✓	
	MSCS 404	Dissertation	Gain practical experience of various research areas in computer science field	✓	✓	✓	✓
	MSCS E401	Cyber Crime and Security Fundamentals	Cyber Crime and Classification, Computer Vandalism, Cyber Security Techniques, Case Study	✓	✓	✓	✓