

## BACHELOR OF COMPUTER APPLICATIONS (BCA)

One of the most important benefits of taking computer courses is that the students will have more jobs available to them. The types of new jobs that will be available depend on what kind of courses they take, but every group of courses will open up new opportunities. Almost all jobs require that a worker has some computer skills. The number of positions available to those *who aren't comfortable using computers gets smaller each day.*

### Bachelor of Computer Applications (B.C.A, Honours) Programme: (CBCS System under Gauhati University):

#### Program Outcome (PO)

**PO 1. Disciplinary Knowledge:** Demonstrate comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.

**PO 2. Social Interaction:** express thoughts and ideas effectively in writing and orally; listen and communicate with others using appropriate media. Work effectively and respectfully with diverse teams; act together as a group or a team in the interests of a common cause; Elicit views of others, mediate disagreements and help reach conclusions in group settings.

**PO 3. Effective Citizenship:** Demonstrate empathetic social concern and equity centred national development, and act with an informed awareness of issues and participate in civic life through volunteering; embrace moral/ ethical values in conducting one's life, possess knowledge of the values and beliefs of multiple cultures and a global perspective; engage in a multicultural society and interact respectfully with diverse groups.

**PO 4. Environment and Sustainability:** Understand the issues of environmental contexts and sustainable development.

**PO 5. Information and Digital Literacy:** Use ICT in a variety of learning situations; demonstrate ability to access, evaluate and use a variety of relevant information sources; and use appropriate software for analysis of data.

**PO 6. Research-related skills:** Critically evaluate practices, policies and theories by following scientific approach to knowledge development. Have a sense of inquiry and capability for asking relevant/ appropriate questions, problematizing, synthesizing and articulating; ability to recognize cause- and-

<p><b>Program Specific Outcomes (PSOs)</b></p>	<p>The completion of the <b>BCA Programme</b> (under <b>CBCS</b>) shall enable a student to:–</p> <p><b>PSO 1. Understand the core theoretical concept of Computer Applications:</b> Understand the core theoretical principles of Computer Applications.</p> <p><b>PSO 2. Acquire analytical and logical skill for higher Education:</b> Acquire the ability to analyses critical problems logically.</p> <p><b>PSO 3. Excel in the field of Computer Science &amp; Applications and learn good laboratory practices particularly in terms of Programming and security of data:</b> Learn to handle Computer Programming experiments to solve certain mathematical and logical problems perfectly, accurately and safely.</p> <p><b>PSO 4. Take up jobs in allied fields:</b> Use the knowledge of Computer Science &amp; Application to seek opportunities in other allied fields (i.e., sister concerns) like Mathematics, Physics, Statistics, Commerce and Management.</p>
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**SEMESTER I (CORE PAPERS) CBCS SYSTEM**

**NAME: INTRODUCTION TO C PROGRAMMING**

**PAPER CODE: BCA-HC-1016**

UNIT	COURSE OUTCOME	BLOOM'S TAXONOMY
UNIT 1: Overview of C	<b>CO1:</b> Understand the history and importance of the C programming language; master basic syntax and structure .	Remembering, Understanding
UNIT 2: Decision Making and Branching Statement	<b>CO2:</b> Implement conditional statements and loops for decision making; employ branching techniques for efficient control flow.	Applying, Analyzing
UNIT 3: Arrays	<b>CO3:</b> Manipulate single-dimensional and multi-dimensional arrays; develop algorithms using arrays.	Applying, Understanding

UNIT 4: Functions	<b>CO4:</b> Create and use functions for modular programming; understand scope, recursion, and parameter passing.	Applying, Analyzing
UNIT 5: Structures and Unions	<b>CO5:</b> Define and utilize structures for data organization; differentiate and apply structures and unions.	Understanding, Analyzing
UNIT 6: Pointers	<b>CO6:</b> Utilize pointers for dynamic memory allocation; implement pointer arithmetic and understand its applications.	Applying, Analyzing
UNIT 7: File Management in C	<b>CO7:</b> Handle file operations (read/write) in C; implement file handling techniques for data storage and retrieval.	Applying, Analyzing

Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4
CO1	H		L	L	M	M	H	M	L	L
CO2	H	M	M	L	M	H	M	H	M	L
CO3	H			L	M	H	M	H	M	L
CO4	H	M	M	L	M	H	M	H	M	L
CO5	H		L	L	M	M	H	H	M	L
CO6	H	L	L		M	H	M	H	H	L
CO7	H	L	M	M	M	H	H	H	H	M

**NAME: COMPUTER FUNDAMENTALS & ICT HARDWARE**

**PAPER CODE: BCA-HC-1026**

Unit	Course Outcome	Bloom's Taxonomy Level
UNIT 1: Overview of Computer	<b>CO1:</b> Understand the evolution of computer systems, components, number systems, and basic programming concepts.	Remembering, Understanding
UNIT 2: Hard Disk Drive	<b>CO2:</b> Understand the logical structure and file systems of hard disks; utilize hard disk tools.	Applying, Understanding

Unit	Course Outcome	Bloom's Taxonomy Level
UNIT 3: Optical Media	<b>CO3:</b> Understand the operation and maintenance of optical media such as CD and DVD drives.	Applying, Understanding
UNIT 4: Processor and Motherboard	<b>CO4:</b> Understand processor types and trends; comprehend motherboard components and memory concepts.	Remembering, Understanding
UNIT 5: Networking Components	<b>CO5:</b> Understand SMPS, BIOS, NIC, network cabling, and IP addressing.	Remembering, Applying

Course Outcomes (COs)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4
CO1	H	L	L	L	M	M	H	M	L	L
CO2	H	M	M	L	M	H	M	H	M	
CO3	H		L	L	M	H	M	H	M	L
CO4	H	M	M	L	M	H	M	H	M	
CO5	H	L	L	L	M	H	M	H	H	L

## SEMESTER II (CORE PAPERS) CBCS SYSTEM

NAME: MATHEMATICS –I

PAPER CODE: BCA-HC-2016

Unit	Course Outcome	Bloom's Taxonomy Level
UNIT 1: Determinants and Matrices	<b>CO1:</b> Understand definitions, types, and operations on matrices; solve linear equations using matrix methods.	Remembering, Understanding, Applying

Unit	Course Outcome	Bloom's Taxonomy Level
UNIT 2: Complex Numbers	<b>CO2:</b> Understand the properties and representations of complex numbers; solve equations involving complex numbers.	Remembering, Understanding, Applying
UNIT 3: Limits and Derivatives	<b>CO3:</b> Understand the concepts of limits and derivatives; apply them to polynomial and trigonometric functions.	Remembering, Understanding, Applying
UNIT 4: Calculus	<b>CO4:</b> Apply theorems and techniques to find limits, derivatives, and to solve maxima and minima problems.	Understanding, Applying, Analyzing

Course Outcomes (COs)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4
CO1	H	L	L	L	M	M	H	M	M	L
CO2	H		L	L	M	M	H	M	M	L
CO3	H		L	L	M	M	H	M	M	L
CO4	H	L	L	L	M	M	H	M	M	

**NAME: DIGITAL LOGIC FUNDAMENTALS**

**PAPER CODE: BCA-HC-2026**

<b>Unit</b>	<b>Course Outcome</b>	<b>Bloom's Taxonomy Level</b>
<b>UNIT 1: Boolean Algebra and Logic Gates</b>	Understand Boolean algebra, logic gates, and implement logic expressions using gates.	Remembering, Understanding, Applying
<b>UNIT 2: Combinational Circuit</b>	Understand and implement combinational circuits like adders, subtractors, and multiplexers.	Remembering, Understanding, Applying
<b>UNIT 3: Sequential Circuit</b>	Understand and design sequential circuits like flip-flops and analyze clocked sequential circuits.	Remembering, Understanding, Applying, Analyzing
<b>UNIT 4: Counters</b>	Understand different types of counters and design counters using state diagrams and equations.	Remembering, Understanding, Applying, Analyzing
<b>UNIT 5: Registers</b>	Understand and implement various types of registers and their applications.	Remembering, Understanding, Applying

<b>Course Outcomes (COs)</b>	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>
<b>CO1</b>	H	L	L		M	M	H	M	M	L
<b>CO2</b>	H	L	L		M	M	H	M	M	L
<b>CO3</b>	H	L	L		M	M	H	M	M	L
<b>CO4</b>	H	L	L		M	M	H	M	M	L
<b>CO5</b>	H	L	L		M	M	H	M	M	L

**SEMESTER III (CORE PAPERS) CBCS SYSTEM**

**NAME: SOFTWARE ENGINEERING**

**PAPER CODE: BCA-HC-3016**

Unit	Course Outcome	Bloom's Taxonomy Level
<b>UNIT 1: Introduction</b>	<b>CO1:</b> Understand software processes, life cycle models, and requirements analysis techniques.	Remembering, Understanding, Applying
<b>UNIT 2: Software Project Planning</b>	<b>CO2:</b> Understand and apply project planning techniques including size and cost estimation models.	Remembering, Understanding, Applying
<b>UNIT 3: Software Design</b>	<b>CO3:</b> Understand and implement software design principles and metrics.	Understanding, Applying, Analyzing
<b>UNIT 4: Software Testing and Maintenance</b>	<b>CO4:</b> Understand and apply software testing, maintenance processes, and tools for quality assurance.	Understanding, Applying, Analyzing

Course Outcomes (COs)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4
<b>CO1</b>	H	L	L		M	M	H	M	M	L
<b>CO2</b>	H	L	L		M	M	H	M	M	L
<b>CO3</b>	H	L	L		M	M	H	M	M	L
<b>CO4</b>	H	L	L		M	M	H	M	M	L

**NAME: DATA STRUCTURE AND ALGORITHMS**

**PAPER CODE: BCA-HC-3026**

Unit	Course Outcome	Bloom's Taxonomy Level
<b>UNIT 1: Definition</b>	<b>CO1:</b> Understand data types, elementary structures, and memory representation of arrays.	Remembering, Understanding, Applying
<b>UNIT 2: Linked Structure</b>	<b>CO2:</b> Understand and manipulate singly and doubly linked lists; compare with array implementations.	Remembering, Understanding, Applying, Analyzing
<b>UNIT 3: Stacks and Queues</b>	<b>CO3:</b> Understand and apply stacks and queues in various applications, including postfix conversion.	Remembering, Understanding, Applying
<b>UNIT 4: Binary Trees</b>	<b>CO4:</b> Understand binary trees, properties, traversal algorithms, and threaded trees.	Remembering, Understanding, Applying, Analyzing
<b>UNIT 5: Searching</b>	<b>CO5:</b> Implement and analyze linear and binary search algorithms; construct binary search trees.	Remembering, Understanding, Applying, Analyzing
<b>UNIT 6: Sorting</b>	<b>CO6:</b> Understand and apply various sorting algorithms, their complexity, and implementation details.	Remembering, Understanding, Applying, Analyzing
<b>UNIT 7: Analysis of Algorithm</b>	<b>CO7:</b> Analyze time and space complexity, perform average and worst-case analysis of algorithms.	Understanding, Applying, Analyzing, Evaluating

Course Outcomes (COs)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4
<b>UNIT 1: Definition</b>	H	L	L	L	M	M	H	M	M	L
<b>UNIT 2: Linked Structure</b>	H	L	L	L	M	M	H	M	M	L
<b>UNIT 3: Stacks and Queues</b>	H	L		L	M	M	H	M	M	L
<b>UNIT 4: Binary Trees</b>	H		L	L	M	M	H	M	M	L
<b>UNIT 5: Searching</b>	H	L	L		M	M	H	M	M	
<b>UNIT 6: Sorting</b>	H	L	L	L	M	M	H	M	M	
<b>UNIT 7: Analysis of Algorithm</b>	H	L	L	L	M	M	H	M	M	L

**NAME: DATABASE MANAGEMENT SYSTEM**

**PAPER CODE: BCA-HC-3036**

Unit	Course Outcome	Bloom's Taxonomy Level
UNIT 1: File Structure	<b>CO1:</b> Understand record storage, file organization, and issues in physical design.	Remembering, Understanding, Applying
UNIT 2: Overview of DBMS	<b>CO2:</b> Understand the differences between traditional file approaches and DBMS; comprehend DBMS architecture.	Remembering, Understanding
UNIT 3: Relational Models	<b>CO3:</b> Understand relational models, integrity rules, and SQL; implement queries and constraints.	Remembering, Understanding, Applying, Analyzing
UNIT 4: Database Design	<b>CO4:</b> Understand database design concepts, ER models, normalization, and database connectivity using JDBC.	Remembering, Understanding, Applying, Analyzing

Course Outcomes (COs)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4
<b>CO1</b>	H	L	L	L	M	M	H	M	M	L
<b>CO2</b>	H		L		M	M	H	M	M	
<b>CO3</b>	H	L		L	M	M	H	M	M	
<b>CO4</b>	H	L	L	L	M	M	H	M	M	L

**SEMESTER IV (CORE PAPERS) CBCS SYSTEM**

**NAME: COMPUTER ORGANIZATION AND ARCHITECTURE**

**PAPER CODE: BCA-HC-4016**

Unit	Course Outcome	Bloom's Taxonomy Level
<b>UNIT 1: Introduction</b>	<b>CO1:</b> Understand functional units of a computer, basic instructions, memory operations, and addressing modes.	Remembering, Understanding, Applying
<b>UNIT 2: Register Transfer Logic</b>	<b>CO2:</b> Understand and implement inter-register transfers, arithmetic and logic micro-operations, and design a simple computer.	Remembering, Understanding, Applying, Analyzing
<b>UNIT 3: Processor Logic Design</b>	<b>CO3:</b> Understand processor organization and design arithmetic and logic circuits.	Understanding, Applying, Analyzing
<b>UNIT 4: Control Logic Design</b>	<b>CO4:</b> Understand hardware control, micro-programmed control, and design a micro-programmed CPU.	Remembering, Understanding, Applying, Analyzing
<b>UNIT 5: I/O Subsystem</b>	<b>CO5:</b> Understand and implement program-controlled I/O, interrupts, and DMA.	Remembering, Understanding, Applying
<b>UNIT 6: Memory Subsystem</b>	<b>CO6:</b> Understand semiconductor memory, SRAM, DRAM, ROM, cache memory, and mapping functions.	Remembering, Understanding, Applying

Course Outcomes (COs)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4
<b>CO1</b>	H	L	L	L	M	M	H	M	M	L
<b>CO2</b>	H	L	L	L	M	M	H	M	M	L
<b>CO3</b>	H	L	L	L	M	M	H	M	M	L
<b>CO4</b>	H	L	L	L	M	M	H	M	M	L
<b>CO5</b>	H	L	L	L	M	M	H	M	M	L
<b>CO6</b>	H	L	L	L	M	M	H	M	M	L

**NAME: MATHEMATICS-II**

**PAPER CODE: BCA-HC-4026**

<b>Unit</b>	<b>Course Outcome</b>	<b>Bloom's Taxonomy Level</b>
UNIT 1: Sets, Relations and Functions	<b>CO1:</b> Understand sets, relations, properties, functions, and principles of mathematical induction.	Remembering, Understanding, Applying
UNIT 2: Graph Theory	<b>CO2:</b> Understand basic graph concepts, algorithms, and tree structures.	Remembering, Understanding, Applying, Analyzing
UNIT 3: Combinatorics	<b>CO3:</b> Understand counting principles, pigeonhole principle, permutations, and combinations.	Remembering, Understanding, Applying, Analyzing
UNIT 4: Matrices	<b>CO4:</b> Understand matrices, determinants, inverse, rank, and solve simultaneous linear equations.	Remembering, Understanding, Applying, Analyzing
UNIT 5: Logic	<b>CO5:</b> Understand connectives, truth tables, normal forms, propositional calculus, and Boolean algebra.	Remembering, Understanding, Applying, Analyzing
UNIT 6: Vector Space	<b>CO6:</b> Understand vector spaces, basis, dimension, and properties of linearly independent/dependent sets.	Remembering, Understanding, Applying, Analyzing

<b>Course Outcomes (COs)</b>	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>
<b>CO1</b>	H	L	L	L	M	M	H	M	M	L
<b>CO2</b>	H		L	L	M	M	H	M	M	L
<b>CO3</b>	H		L	L	M	M	H	M	M	
<b>CO4</b>	H	L	L	L	M	M	H	M	M	
<b>CO5</b>	H		L	L	M	M	H	M	M	L
<b>CO6</b>	H	L	L	L	M	M	H	M	M	L

**NAME: OBJECT ORIENTED PROGRAMMING IN C++****PAPER CODE: BCA-HC-4036**

<b>Unit</b>	<b>Course Outcome</b>	<b>Bloom's Taxonomy Level</b>
UNIT 1: Introduction to object-oriented programming	<b>CO1:</b> Understand the origins, basic concepts, benefits, and structure of C++ programs.	Remembering, Understanding, Applying
UNIT 2: Classes and objects	<b>CO2:</b> Understand and implement classes, objects, constructors, destructors, and memory allocation in C++.	Remembering, Understanding, Applying, Analyzing
UNIT 3: Function and operator overloading	<b>CO3:</b> Understand and apply concepts of function and operator overloading, including type conversion.	Remembering, Understanding, Applying, Analyzing
UNIT 4: Inheritance	<b>CO4:</b> Understand and implement various types of inheritance, polymorphism, and virtual functions in C++.	Remembering, Understanding, Applying, Analyzing
UNIT 5: Streams	<b>CO5:</b> Understand C++ stream classes, formatted I/O operations, and user-defined manipulators.	Remembering, Understanding, Applying
UNIT 6: Files	<b>CO6:</b> Understand and implement file handling operations in C++, including reading, writing, and random-access files.	Remembering, Understanding, Applying

<b>Course Outcomes (COs)</b>	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>
<b>CO1</b>	H	L	L	L	M	M	H	M	M	L
<b>CO2</b>	H	L	L	L	M	M	H	M	M	L
<b>CO3</b>	H	L	L	L	M	M	H	M	M	L
<b>CO4</b>	H	L	L	L	M	M	H	M	M	L
<b>CO5</b>	H	L	L	L	M	M	H	M	M	L
<b>CO6</b>	H	L	L	L	M	M	H	M	M	L

**SEMESTER V (CORE PAPERS) CBCS SYSTEM**

**NAME: JAVA PROGRAMMING**

**PAPER CODE: BCA-HC-5016**

Unit	Course Outcome	Bloom's Taxonomy Level
<b>UNIT 1: JAVA language basics</b>	<b>CO1:</b> Understand Java basics, JVM concepts, primitive data types, and type conversion.	Remembering, Understanding, Applying
<b>UNIT 2: Operators and Control Statements</b>	<b>CO2:</b> Understand and apply Java operators and control statements.	Remembering, Understanding, Applying
<b>UNIT 3: Classes and Methods</b>	<b>CO3:</b> Understand and implement classes, objects, constructors, and various methods in Java.	Remembering, Understanding, Applying, Analyzing
<b>UNIT 4: Inheritance</b>	<b>CO4:</b> Understand and implement inheritance, polymorphism, multithreading, and interfaces in Java.	Remembering, Understanding, Applying, Analyzing
<b>UNIT 5: Exception handling</b>	<b>CO5:</b> Understand and implement exception handling, I/O operations, applet basics, and event handling in Java.	Remembering, Understanding, Applying

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4
<b>CO1</b>	H	L	L		M	M	H	M	M	L
<b>CO2</b>	H	L	L		M	M	H	M	M	L
<b>CO3</b>	H		L		M	M	H	M	M	
<b>CO4</b>	H	L	L		M	M	H	M	M	L
<b>CO5</b>	H		L		M	M	H	M	M	L

**NAME: OPERATING SYSTEM****PAPER CODE: BCA-HC-5026**

<b>Unit</b>	<b>Course Outcome</b>	<b>Bloom's Taxonomy Level</b>
UNIT 1: Introduction	<b>CO1:</b> Understand the basics of operating systems, their generations, and types.	Remembering, Understanding
UNIT 2: Processes	<b>CO2:</b> Understand process concepts, states, creation, termination, context switching, and multithreading basics.	Remembering, Understanding, Applying
UNIT 3: Process Synchronization	<b>CO3:</b> Understand inter-process communication, race conditions, mutual exclusion, and classical IPC problems.	Remembering, Understanding, Applying, Analyzing
UNIT 4: Scheduling	<b>CO4:</b> Understand scheduling concepts, objectives, criteria, and different scheduling algorithms.	Remembering, Understanding, Applying, Analyzing
UNIT 5: Deadlocks	<b>CO5:</b> Understand deadlock concepts, characteristics, prevention, detection, recovery, and avoidance using algorithms.	Remembering, Understanding, Applying, Analyzing
UNIT 6: Memory management	<b>CO6:</b> Understand memory management, virtual memory, paging, segmentation, and page replacement algorithms.	Remembering, Understanding, Applying, Analyzing
UNIT 7: File system	<b>CO7:</b> Understand file concepts, types, attributes, operations, access methods, directories, and file system layouts.	Remembering, Understanding, Applying
UNIT 8: I/O management	<b>CO8:</b> Understand the principles and structure of I/O management subsystems, device controllers, and I/O software layers.	Remembering, Understanding, Applying

Course Outcomes (COs)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4
CO1	H	L	L		M	M	H	M	M	L
CO2	H	L	L		M	M	H	M	M	L
CO3	H	L	L		M	M	H	M	M	L
CO4	H	L			M	M	H	M	M	L
CO5	H		L		M	M	H	M	M	L
CO6	H	L	L		M	M	H	M	M	
CO7	H	L	L		M	M	H	M	M	L
CO8	H	L	L		M	M	H	M	M	L

**SEMESTER VI (CORE PAPERS) CBCS SYSTEM****NAME: SYSTEM ADMINISTRATION USING LINUX****PAPER CODE: BCA-HC-6016**

<b>Unit</b>	<b>Course Outcome</b>	<b>Bloom's Taxonomy Level</b>
UNIT 1: Introduction	<b>CO1:</b> Understand the role and power of a system administrator, Linux OS basics, and common Linux distributions.	Remembering, Understanding, Applying
UNIT 2: Linux file system	<b>CO2:</b> Understand Linux file systems, file types, file attributes, and file system operations.	Remembering, Understanding, Applying
UNIT 3: Basic Linux Commands	<b>CO3:</b> Understand and use basic Linux commands, file and directory handling, shell scripts, and user/group permissions.	Remembering, Understanding, Applying
UNIT 4: Process Creation	<b>CO4:</b> Understand and manage processes, background jobs, crontab, and printing in Linux.	Remembering, Understanding, Applying, Analyzing
UNIT 5: General User Administration	<b>CO5:</b> Understand user management, system monitoring, logging, and memory usage monitoring in Linux.	Remembering, Understanding, Applying
UNIT 6: Networking in Linux	<b>CO6:</b> Understand IP addressing, network configuration, and basic network services and security in Linux.	Remembering, Understanding, Applying, Analyzing

Course Outcomes (COs)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4
CO1	H	L	L		M	M	H	M	M	L
CO2	H		L		M	M	H	M	M	
CO3	H	L			M	M	H	M	M	L
CO4	H		L		M	M	H	M	M	L
CO5	H	L	L		M	M	H	M	M	
CO6	H	L	L		M	M	H	M	M	L

**NAME: COMPUTER NETWORKS**

**PAPER CODE: BCA-HC-6026**

Unit	Course Outcome	Bloom's Taxonomy Level
UNIT 1: Physical Layer	<b>CO1:</b> Understand the basics of data communications, network criteria, physical structures, and network models.	Remembering, Understanding
UNIT 2: Digital Transmission	<b>CO2:</b> Understand and apply concepts of digital and analog transmission, multiplexing, and transmission media.	Remembering, Understanding, Applying
UNIT 3: Data Link Layer	<b>CO3:</b> Understand and implement error correction and detection methods, data link control protocols, and multiple access techniques.	Remembering, Understanding, Applying, Analyzing
UNIT 4: Network Layer	<b>CO4:</b> Understand wired and wireless LANs, network layer protocols, and address mapping protocols.	Remembering, Understanding, Applying, Analyzing
UNIT 5: Transport Layer	<b>CO5:</b> Understand routing protocols, transport layer concepts, and techniques for congestion control and quality of service.	Remembering, Understanding, Applying, Analyzing

Unit	Course Outcome	Bloom's Taxonomy Level
UNIT 6: Application Layer & Network Security	<b>CO6:</b> Understand DNS, email architecture, file transfer protocols, HTTP, and basics of network security.	Remembering, Understanding, Applying

Course Outcomes (COs)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4
CO1	H	L	L		M	M	H	M	M	L
CO2	H	L	L		M	M	H	M	M	L
CO3	H	L			M	M	H	M	M	
CO4	H		L		M	M	H	M	M	L
CO5	H	L			M	M	H	M	M	L
CO6	H	L	L		M	M	H	M	M	