

# Teaching Plan

For Session: 2021 - 2022



Department Of Computer Applications

Morigaon College

ODD SEMESTER

1<sup>st</sup> SEMESTER

BCA-HC-1016 Introduction to C programming

4 Lectures, 4 Practical, Credits 6 (4+2) Theory: 60 Lectures, Practical: 60 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
BULBUL DAS	UNIT 1: Overview of C	Importance of C, sample C program, C program structure, executing C program. Variables, Data Types, Constants: integer constant, real constant, character constant, string constant; Character set, C tokens, keywords and identifiers, variables declaration, Assigning values to variables--- Assignment statement, declaring a variable as constant, as volatile. Operators and Expression: Categories of operator- Arithmetic, Relational, logical, assignment, increment, decrement, conditional, bitwise and special operators; arithmetic expressions, precedence and associativity of operators, type conversions, mathematical functions Managing Input and Output Operators: Reading and writing a character, formatted input, formatted output.	10 LECTURES 01-10-2021 18-10-2021	Class test on 18-10-2021
	UNIT 2: Decision Making and Branching Statement	if statement, if.....else statement, nested if.... else statement, switch....case statement, goto statement. Decision Making and Looping: Definition of loop, categories of loops, for loop while loop, do-while loop, break statement, continue statement	8 LECTURES 19-10-2021 29-10-2021	Class test on 29-10-2021
	UNIT 3: Arrays	Declaration and accessing of one & two-dimensional arrays, initializing two-dimensional arrays, multidimensional arrays.	6 LECTURES 01-11-2021 09-11-2021	Class test on 09-11-2021
	UNIT 4: Functions	The form of C functions, Return values and types, return statement, calling a function, categories of functions, Nested functions, Recursion, functions	10 LECTURES 10-11-2021 25-11-2021	Class test on 25-11-2021

		with arrays, call by value, call by reference, storage classes, Macro substitution, file inclusion.		
	UNIT 5: Structures and Unions	Defining, giving values to members, initialization and comparison of structure variables, array of structure, array within structure, structure within structure, structures and functions, unions.	8 LECTURES 29-11-2021 09-12-2021	Class test on 09-12-2021
	UNIT 6: Pointers	Definition of pointer, declaring and initializing pointers, accessing a variable through address and through pointer, pointer expressions, pointer increments and scale factor, pointers and arrays, pointers and functions, pointers and structures.	10 LECTURES 13-12-2021 29-12-2021	Class test on 29-12-2021
	UNIT 7: File Management in C	Opening, closing and I/O operations on files, random access to files, command line arguments.	8 LECTURES 03-01-2022 13-01-2022	Class test on 13-01-2022

### BCA-HC-1026 Computer Fundamentals & ICT Hardware

4 Lectures, 4 Practical, Credits 6 (4+2) Theory: 60 Lectures, Practical: 60 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
ABDUL MALIK	UNIT-1	Evolution of Computer system, Classification of Computer, Modern Computer, Hardware and Software, Major components of a Digital Computer (A brief introduction of CPU, Main memory, Secondary memory devices and I/O devices) Keyboard, monitor, mouse, printers, Secondary storage devices (floppy disks, hard disks and optical disks), backup system and why it is needed? Bootstrapping a Computer, Number System: Representation of numbers (only a brief introduction to be given) and characters in computer, Binary, Hexadecimal, Octal, BCD, ASCII, EDCDIC and Gray codes, Conversion of bases, Representation of signed integers, Sign and magnitude, 1's complement and 2's complement	20 LECTURES 01-10-2021 25-10-2021	Class test on 25-10-2021

		representation. Arithmetic operations using 2's complement representation and conditions for overflow/underflow and its detection, Assembler, Compiler, Interpreter, Linker and Loader, Definition and concepts of algorithm and its different implementations-pseudo code, flowchart and Computer programs.		
	UNIT-2	Hard Disk Drive: logical structure and file system, FAT, NTFS. Hard disk tools: Disk cleanup, error checking, de fragmentation, scanning for virus, formatting, installing additional HDD, New trends in HDD, Floppy Disk Drive.	10 Lectures 26-10-2021 10-11-2021	Class test on 10-11-2021
	UNIT-3	Optical Media, CDROM, theory of operation, drive speed, buffer, cache, CD-R, CD-RW, DVD ROM, DVD technology, preventive maintenance for DVD and CD drives, Driver installation, Writing-cleaning CD and DVD.	10 Lectures 11-11-2021 25-11-2021	Class test on 25-11-2021
	UNIT-4	Processor: Intel processor family. Latest trends in processor, Motherboard, Sockets and slots, power connectors, Peripheral connectors. Bus slots, USB, pin connectors, Different kinds of motherboards, RAM, different kinds of RAM. RAM up gradation, Cache and Virtual Memory concept.	10 Lectures 26-11-2021 08-12-2021	Class test on 08-12-2021
	UNIT-5	SMPS, BIOS, Network Interface Card, network cabling, I/O Box, Switches, RJ 45 connectors, Patch panel, Patch cord, racks, IP address.	10 Lectures 09-12-2021 21-12-2021	Class test on 21-12-2021

### **BCA-HG-1016: Computer Based Accounting and Financial Management**

(Credit: 4+2=6) (L: 4, P: 4, T: 0) Theory: 60 Lectures, Practical: 60 Lectures

DEPT.	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
COMMERCE	UNIT 1: Accounting	Definition, function, objective, need, advantage, events and transaction, double entry system of book keeping, Books of accounts: classification of books of accounts, meaning of	20 Lectures 4-10-2021 11-11-2021	Test on 4-11-2021

		journal, journalizing of transactions, ledger and ledger posting, closing of books of accounts and preparation of trial balance, Cash book: single column, double column and triple column, depreciation, Financial statements: Trading, Profit and Loss Account and Balance Sheet.		
	UNIT 2: Tally	<p>Versions of Tally, Features of Tally, ERP Features, Data Directory and Tally switching between screen areas, Company creation: Create/Alter/Select/Close/Delete, Introduction on F11 features &amp; F12 configuration, Basic Accounting: Accounting Info Ledger/Group (Single &amp; Multiple) Create/Display/Alter/Delete, Accounting Voucher: Types of Voucher, Configuring Voucher, Voucher Creation, Entering/Altering &amp; Deleting, Basic of Tally Inventory: "Integrated A/c with Inventory" Create/Display/Alter/(Single &amp; Multiple) : Group, Category, Go down, Units (Simple/Compound), Invoicing :Purchase &amp; Sales in Invoice format, Debit Credit notes/Discount/Description, Inventory Voucher</p>	20 Lectures 8-11-2021 02-12-2021	Test on 02-12-2021
	UNIT 3: Advanced Accounting	<p>Bill wise Details: Transaction wise Bill By Bill for trading &amp; non trading organization, Interest Calculation: Simple &amp; Advance parameters Interest calculation on outstanding Balances, use of vouchers class, Adjustment entries, BRS: Simple &amp; Advanced, Multiple Currencies: Create of different currencies, voucher entries, Adjustment entries on for ex gain / loss,</p>	20 Lectures 6-12-2021 6-01-2022	Test on 6-01-2022

		<p>Cost Center &amp; Cost Categories: (By using purchase, Sales, Receipt, Payment voucher) Create / Alter / Display, Advance Inventory- Actual/Different Billed Qty, O'Value, Batch wise, Alternate Units, BOM, Price List , Budget &amp; Control : Create / Alter, Budget for group / ledger / cost Center, Scenario Mgt : Create / Alter / Delete. Transactions,</p> <p>Administration: Security control, Tally Audit, Housekeeping: Group company, Split company Export Data, ODBC, Printing: Company printing option, Setting toa Bill.</p>		
--	--	---	--	--

### 3<sup>rd</sup> SEMESTER

#### BCA-HC-3016: SOFTWARE ENGINEERING

(Credit: 5+1=6) (L: 5, P: 0, T: 1) Theory: 60 Lectures, Tutorial: 15 Lectures

FACULTY NAME	Unit	Topics	AIM TO BE COMPLETED	REMARKS
PONKHI BANIKYA	1	Software Processes & Characteristics, Software life cycle Models: Waterfall, Prototype, Evolutionary and Spiral Models, Software Requirements analysis & specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries, ER Diagrams, Requirement's documentation, Nature of SRS, Characteristics & organization of SRS.	20 Lectures 23-10-2021 16-11-2021	Class test on 16-11-2021
	2	Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management.	10 Lectures 17-11-2021 30-11-2021	Class test on 30-11-2021
	3	Data design, Architectural design, Interface design, Function Oriented Design, Object Oriented Design, Cohesion & Coupling, Classification of Cohesiveness & Coupling, Software Metrics: different types of projects matrices	10 Lectures 01-12-2021 13-12-2021	Class test on 13-12-2021
	4	Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing, Debugging Activities, Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation, Software quality Assurance, CASE tools: Analysis tools, design tools, SQA tools, software testing tools.	20 Lectures 14-12-2021 08-01-2022	Class test on 08-01-2022

**BCA-SE-3014: WEB TECHNOLOGY**

(Credit: 2+2=4) (L: 2, P: 4, T: 0) Theory: 20 Lectures, Practical: 20 Lectures

FACULTY NAME	Unit	Topics	AIM TO BE COMPLETED	REMARKS
PONKHI BANIKYA	UNIT 1: Overview of the World Wide Web and the internet	A brief history of TCP/IP and the Internet, Internet services-email, telnet, ftp, Internet components, the birth of web, web page, home page, web site, Web browsers-Netscape navigator and IE, Web browser helper applications, Introduction to web servers and their architecture, Review of some popular web servers like Apache, Nginx, Litespeed, Tomcat etc.	2 Lectures 25-10-2021 28-10-2-21	Class test on 28-10-2-21
	UNIT 2: Inside the firewall AND Linking database to the Web	Firewall, proxy server, overview of intranet security, web server security, username/password authentication, COM, DCOM, CORBA, JDBC, ODBC- CGI, ASP and PHP, Dynamic page creation and advantages	3 Lectures 01-11-2021 04-11-2021	Class test on 04-11-2021
	UNIT 3: HTML editors and tools	Basic HTML, HTML tags, creating list in HTML, hyperlinks, multimedia, HTML forms, tables in HTML, frames in HTML, image maps, style sheets in HTML. DHTML, XML- Introduction, syntax, DTD	5 Lectures 8-11-2021 16-11-2021	Class test on 16-11-2021
	UNIT 4: Java Script	Client side Scripting languages, creating interactive documents using JavaScript	10 Lectures 17-11-2021 08-12-2021	Class test on 08-12-2021

**BCA-HC-3026: DATA STRUCTURE AND ALGORITHMS**

(4+2=6) (L: 4, P: 4, T: 0) Theory: 60 Lectures, Practical: 60 Lectures

FACULTY NAME	Unit	Topics	AIM TO BE COMPLETED	REMARKS
ABDUL MALIK	UNIT 1: Definition	Definition Concept of Data Types, elementary structure, words and their interpretations, packed words, Arrays: Types, memory representation, address	04 Lectures 01-10-2021 07-10-2021	Class test on 07-10-2021



		translation functions for one- & two-dimensional arrays, different examples.		
	UNIT 2: Linked Structure	Linked Structure Singly and doubly linked list, circular and non-circular, list manipulation with pointers, example involving insertion and deletion of elements and their comparative studies with implementations using array structure	08 Lectures 08-10-2021 20-10-2021	Class test on 20-10-2021
	UNIT 3: Stacks and Queues	Stacks and Queues Definitions, representation using array and linked list structure, application of stack and queues in simulation, postfix conversion and evolution of arithmetic expressions	06 Lectures 21-10-2021 28-10-2021	Class test on 28-10-2021
	UNIT 4: Binary Trees	Binary Trees Definition, quantitative properties, memory representation, Trees traversal algorithms (recursive and non-recursive), threaded trees, BFS, DFS	12 Lectures 29-10-2021 14-11-2021	Class test on 14-11-2021
	UNIT 5: Searching	Searching Linear and binary search algorithms, performance and complexity, binary search trees (construction, insertion, deletion and search), Concept of optimal binary search trees	10 Lectures 15-11-2021 26-11-2022	Class test on 26-11-2022
	UNIT 6: Sorting	Sorting Terminology, sorting algorithms (non recursive, recursive description, Complexity, advantages and disadvantage, implementation), bubble sort, insertion sort, selection sort, tree sort, heap sort, quick sort, merge sort & radix sort, external Sorting.	12 Lectures 27-11-2021 15-12-2021	Class test on 15-12-2021
	UNIT 7: Analysis of Algorithm	Analysis of Algorithm Time and Space complexity of algorithms, average case and worst-case analysis, asymptotic notation as a measure of algorithm complexity, O and $\theta$ notations, Analysis of sorting algorithms Selection sort, Bubble sort, Insertion sort, Heap sort, Quick sort and analysis of searching	08 Lectures 16-11-2021 08-01-2022	Class test on 08-01-2022

		algorithms – linear search and binary search.		
--	--	---	--	--

### BCA-HC-3036 Database Management System

(Credit: 4+2=6) (L: 4, P: 4, T: 0) Theory: 60 Lectures, Practical: 60 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
BULBUL DAS	UNIT 1: File Structure	Record storage and primary file organization: memory hierarchies and storage devices, Storage of Databases, placing file records on disks: Records and its Types, Files, Fixed length records and variable length records, Record Blocking, allocating file blocks on disks, operation on files, Issues in Physical Design: Concept of indexes	12 Lectures 01-10-2021 18-10-2021	Class test on 18-10-2021
	UNIT 2: Overview of Database Management System	Definition of Database, Traditional File Approach vs. DBMS approach, Characteristics of the Data Base Approach, DBMS user, Role of a DBA, Advantage of using DBMS, DBMS architecture, Data independence, ANSI/SPARC 3 level architecture.	8 Lectures 19-10-2021 29-10-2021	Class test on 29-10-2021
	UNIT 3: Relational Models	Fundamental integrity rules: entity integrity, referential integrity, Relational algebra (Select, Project, Cross, Product, theta join, equijoin, natural join, outer join), Set Operation, ANSI SQL – 92 Standard: DDL, DML, SQL constructs (Select ... From... Where... Group by .... Having... Order by....), Insert, Delete, Update, View, Definition and use, nested queries, Constraints considers (NOT NULL, UNIQUE, Check Primary key, foreign key)	20 Lectures 01-11-2021 26-11-2021	Class test on 26-11-2021
	UNIT 4: Database Design	Conceptual model, logical model, physical model, ER model as a tool for conceptual design entities, attributes and relationships, weak and strong entities, conversion of ER model into relational schema. DFD, Normalization: informal design guidelines for relational schemas (overview level), functional	20 Lectures 29-11-2021 24-12-2021	Class test on 24-12-2021

		dependencies, different types of keys, Normal forms (first, second, third, BCNF), Functional dependency diagram and design of relational database from it. Database connectivity using JDBC.		
--	--	--	--	--

### BCA-HG-3016: INTRODUCTION TO INDIAN HISTORY

(Credit: 5+1=6) (L: 5, P: 0, T: 1) Theory: 60 Lectures, Tutorial: 15 Lectures

DEPT.	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
HISTORY	UNIT 1	Features of Indus Valley Civilization, Condition of India in Vedic period, Maurya dynasty with reference to Asoka's administration	12 Lectures 1-10-2021 14-10-2021	Class test on 14-10-2021
	UNIT 2	Gupta Period: Samudragupta and Chandragupta II, Harshavardhana-relation with Kamrupa, visit of Hiuen Tsang	12 Lectures 19-10-2021 01-11-2021	Class test on 01-11-2021
	UNIT 3	Foundation of Muslim rule in India: Iltutmish, Balban, Alauddin Khalji, and Muhammad-Bin Tughluq, Rise of Mughal power in India: Akbar and Aurangzeb, Sivaji: character and achievement	12 Lectures 02-11-2021 15-11-2021	Class test on 15-11-2021
	UNIT 4	Arrival of Europeans and establishment of British power after Battle of Plassey, Revolt of 1857	12 Lectures 16-11-2021 30-11-2021	Class test on 30-11-2021
	UNIT 5	Birth of Indian National Congress and Swadeshi Movement, Non-Cooperation Movement and Civil Disobedience Movement, Quit India Movement and independence	12 Lectures 01-12-2021 15-12-2021	Class test on 15-12-2021

### 5<sup>th</sup> SEMESTER

#### BCA-HC-5016 Java Programming

(Credit: 4+2=6) (L: 4, P: 4, T: 0) Theory: 60 Lectures, Practical: 60 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
PONKHI BANIKYA	UNIT 1: JAVA language basics	Basic features, Java virtual machine concepts Creation of JAVA, executing a java program using command line arguments, The primitive data	12 Lectures 01-08-2022 18-08-2022	Class test on 18-08-2022

	types and Variables, Java Key words, integer and floating point data type, character and Boolean types, declaring and initialization variables, Type conversion and casting		
UNIT 2: Operators and Control Statements	Java operators - Arithmetic operators, Bitwise operators, Relational operators, Boolean logical operators, Assignment operator, Conditional operator, if and switch statements, iteration statements, jump statements.	12 Lectures 22-08-2022 08-09-2022	Class test on 08-09-2022
UNIT 3: Classes and Methods	Class fundamentals, Objects, Constructors, this keyword, finalize () method, Overloading methods, garbage collection, Returning objects, introducing access control, understanding static, introducing final, introducing nested and inner classes, String operations, Character Extraction, Comparing, Searching & Modifying the strings, Data conversion using valueOf(), StringBuffer	15 Lectures 12-09-2022 11-10-2022	Class test on 11-10-2022
UNIT 4: Inheritance	Inheritance basics, using super, creating a multilevel hierarchy, method overriding, dynamic method dispatch, using abstract classes, using final with inheritance Packages and interfaces Packages, access protection, importing packages, interfaces Multithread programming, The JAVA thread model, creating a thread, creating a multiple thread, Using is Alive() and join (), Inter thread communication, suspending, resuming and stopping threads, using multithreading.	12 Lectures 12-10-2022 01-11-2022	Class test on 01-11-2022
UNIT 5: Exception handling	Exception handling fundamentals, exception types, uncaught exceptions, using try and catch, multiple catch clauses, nested try statements, throw, throws, finally, Java's built-in Exceptions, Input/output: Java I/O classes and interfaces, file, the stream classes, byte streams, character	12 Lectures 02-11-2022 22-11-2022	Class test on 22-11-2022

		streams, console class. Applet class: Applet basics, applet architecture, simple applet skeleton, applet displaying methods, Event handling: Two event handling mechanisms, delegation event model, event classes, source of events, event listener interface		
--	--	---	--	--

### BCA-HC-5026 Operating System

(Credit: 4+2=6) (L: 4, P: 4, T: 0) Theory: 60 Lectures, Practical: 60 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
BULBUL DAS	UNIT 1: Introduction	Basics of Operating Systems: Definition – Generations of operating systems, Types of Operating Systems (definition only): Mainframe, Batch, Multiprocessor, Distributed, Multitasking, Real time, Parallel and Time sharing.	6 Lectures 02-08-2022 10-08-2022	Class test on 10-08-2022
	UNIT 2: Processes	Process: Concept of a Process, Process States, Process creation, Process termination, Context switching, Thread: Concept of thread, Design issues of thread, Types of threads, Benefits of threads, Basic Concept of multithreading.	6 Lectures 11-08-2022 19-08-2022	Class test on 19-08-2022
	UNIT 3: Process Synchronization	Basic concept of Inter-Process communication, Race condition, Critical-Section, Mutual exclusion, semaphore, Mutex, Different ways to achieve mutual exclusion-Disabling interrupt, Test-and-Set Lock, Peterson's solution using semaphore, Brief discussion on classical IPC problem (example Dining philosopher problem).	6 Lectures 23-08-2022 31-08-2022	Class test on 31-08-2022
	UNIT 4: Scheduling	Basic Concepts of scheduling, Scheduling objectives, pre-emptive and non-pre-emptive scheduling, Scheduling criteria – CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time, Basic concepts on batch, interactive and real-time scheduling	6 Lectures 01-09-2022 09-09-2022	Class test on 09-09-2022

		algorithm, Scheduling algorithms-FCFS, SJF, RR, priority scheduling, Goals of scheduling algorithms.		
	UNIT 5: Deadlocks	Definition, Deadlock characteristics, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock detection and Recovery, Deadlock Avoidance using Banker's Algorithm.	6 Lectures 13-09-2022 21-09-2022	Class test on 21-09-2022
	UNIT 6: Memory management	Memory allocation in Multiprogramming, Relocation and Protection, Swapping, Virtual memory: Basics of Virtual Memory, Logical versus Physical address space, Paging and Concept of Segmentation, Page fault, Page table and its entries, Demand paging, TLB, Page replacement algorithms: LRU, Optimal, NRU, FIFO, second chance, Clock, NFU, Working set.	6 Lectures 22-09-2022 30-09-2022	Class test on 30-09-2022
	UNIT 7: File system	File concepts, File naming, File types (directory, regular, device), File attributes, Operations on file, Access Methods – Sequential, Random access, Directory in UNIX, Hierarchical directory structure, Relative path and Absolute path, Operation on directories, Disk layout, Disk partition, File system layout, Disk block allocation-Contiguous allocation, Linked list allocation, FAT, anodes, File system security	6 Lectures 06-10-2022 14-10-2022	Class test on 14-10-2022
	UNIT 8: I/O management	Basic principles and overall structure of I/O management subsystem, Device controllers, Layers of the I/O subsystem-interrupt handler's device driver, device independent I/O software and user space I/O software.	6 Lectures 18-10-2022 26-10-2022	Class test on 26-10-2022

## BCA-HE-5026: Data Mining & Warehousing

(Credit: 5+1=6) (L: 5, P: 0, T: 1) Theory: 60 Lectures, Tutorial: 15 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
ABDUL MALIK	UNIT 1: Introduction to Data Warehousing	Need for Data Warehousing, Basic elements of Data Warehousing, differences between Database Systems and Data Warehouse. Data Warehouse Architecture and its components, Infrastructure and metadata. Data Design and Data Representation - Principles of dimensional modelling, advanced topics- data extraction, transformation and loading, data quality, OLAP in Data Warehouse, Data warehousing and the web. Implementation and Maintenance: Physical design process, Data Warehouse deployment, growth and maintenance.	12 Lectures 01-08-2022 13-08-2022	Class test on 13-08-2022
	UNIT 2: Introduction to Data Mining Introduction	Basics of data mining, Different definitions of Data Mining and related concepts, Data mining process, Data preparation, data cleaning and data visualization. KDD process, Data mining techniques: Clustering, Association rules and Decision trees.	8 Lectures 16-08-2022 24-08-2022	Class test on 24-08-2022
	UNIT 3: Clustering	Concept of Similarity and distance, Euclidean distance, Manhattan distance, Cosine similarity, Jaccard coefficient, Partitional versus Hierarchical Clustering, different types of data in clustering, Partitional clustering methods – k-means, k-medoids, PAM, CLARA, CLARANS. Hierarchical clustering methods – BIRCH, CURE, Density based clustering methods-DBSCAN.	15 Lectures 25-08-2022 10-09-2022	Class test on 10-09-2022
	UNIT 4: Rule Mining	What is an association rule? Mining association rules, frequent sets and border sets,	15 Lectures 12-09-2022 28-09-2022	Class test on 28-09-2022

		algorithms for mining association rules – Apriori algorithm, Pincer-Search algorithm, Border algorithm.		
	UNIT 5: Classification	Introduction, Clustering versus Classification, decision tree construction principle, decision tree generation algorithms – CART, ID3.	10 Lectures 29-10-2022 14-10-2022	Class test on 14-10-2022



EVEN SEMESTER

2<sup>nd</sup> SEMESTER

**BCA-HC-2016 Mathematics –I**

(Credit: 5+1=6) (L: 5, P: 0, T: 1) Theory: 60 Lectures, Tutorial: 15 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
MATHEMATICS	UNIT 1: Determinants and Matrices	Definition and different types (such as identity matrix, diagonal matrix etc) of matrices, vectors and matrices, Addition, subtraction and multiplication of matrices, Properties of matrix operations, Existence of additive and multiplicative identity and additive inverse matrices, Transpose of a matrix and its properties. Symmetric and skew symmetric matrices, Elementary transformation of a matrix, Invertible matrices, Determinant of a square matrix, minor, cofactor, Adjoint of a matrix and matrix inversion, Determination of rank of a matrix, Eigen values and Eigen vectors of a matrix (Stressing on symmetric matrices), Cayley-Hamilton theorem – Cramer’s rule, Consistency of a system of linear non-homogenous equations and existence of solutions (statement only), Simple problems, Solutions of simultaneous linear equations by Gaussian elimination method.	22 Lectures 18-04-2022 12-05-2022	Class test on 12-05-2022
	UNIT 2: Complex Numbers	Definition and Algebra of complex numbers, Modulus and conjugate of a complex number, Representation of complex numbers - Argand diagram and	16 Lectures 13-05-2022 31-05-2022	Class test on 31-05-2022

		polar representation, Roots of linear and quadratic equations in one variable, real roots, irrational roots, complex roots, Relation between the roots and the coefficients.		
	UNIT 3: Limits and Derivatives	Intuitive idea of limits and derivatives, Limits of polynomials and rational functions, Derivatives, Algebra of derivative of a function, Derivative of polynomials and trigonometric functions.	12 Lectures 01-06-2022 14-06-2022	Class test on 14-06-2022
	UNIT 4: Calculus	Roll's theorem, Lagrange's Mean Value theorem and Taylor's theorem, Meaning of the sign of derivative, indeterminate forms, maxima and minima (single variable).	10 Lectures 15-06-2022 25-06-2022	Class test on 25-06-2022

### BCA-HC-2026: DIGITAL LOGIC FUNDAMENTALS

(Credit: 5+1=6) (L: 5, P: 0, T: 1) Theory: 60 Lectures, Tutorial: 15 Lectures

FACULTY NAME	Unit	Topics	AIM TO BE COMPLETED	REMARKS
ABDUL MALIK	UNIT 1: Boolean Algebra and Logic Gates	Axiomatic definition of Boolean algebra, Rules (postulates and basic theorems) of Boolean algebra, dual and complement of Boolean expression, Canonical form and Standard form, Sum of product and product of sum form, Conversion between Boolean expression and truth table, Karnaugh map method (upto four variable kmap), Don't care condition, and Quine Mc Cluskey method, Different types of gates, Implementation of logic expression with logic gates.	20 Lectures 18-04-2022 15-05-2022	Class test on 15-05-2022
	UNIT 2: Combinational Circuit	Adder: half adder, full adder, Subtractors: half subtractor and full subtractor, Magnitude	12 Lectures 16-05-2022 27-05-2022	Class test on 27-05-2022

		comparator, Decoder, Encoder, Application examples of decoder and encoder, Multiplexer, Demultiplexer, Application examples of multiplexer and Demultiplexer.		
	UNIT 3: Sequential Circuit	Simple RS flip-flop or latch, Clocked RS flip-flop, D flip-flop, JK flip-flop, T flip-flop, Analysis of Clocked Sequential circuits, State Reduction and Assignment, Flip –Flop Excitation tables, Design Procedure for sequential circuits.	12 Lectures 28-05-2022 12-06-2022	Class test on 12-06-2022
	UNIT 4: Counters	Ripple counters: Binary Ripple Counter, BCD Ripple Counter, and Synchronous Counters: Binary Counter, Binary Up and down Counter, BCD Counter, Counter design using state diagram, state table and state equation.	8 Lectures 13-06-2022 21-06-2022	Class test on 21-06-2022
	UNIT 5: Registers	Registers: Shift registers (serial in serial out, serial in parallel out, parallel in serial out, parallel in parallel out), Registers with parallel Load, Bidirectional shift register with parallel load.	8 Lectures 22-06-2022 30-06-2022	Class test on 30-06-2022

### BCA-HG-2016: BASIC ELECTRONICS

(Credit: 5+1=6) (L: 5, P: 0, T: 1) Theory: 60 Lectures, Tutorial: 15 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
PONKHI BANIKYA	UNIT 1: Circuit Concepts and Circuit Analysis	Voltage and Current Sources Resistors: Fixed and Variable resistors, Color coding of resistors, resistors in series and parallel Inductors: Fixed and Variable inductors, Self and mutual inductance, Faraday's law and Lenz's law of electromagnetic induction Capacitors: Principles of capacitance, Parallel plate capacitor, Permittivity, Definition of Dielectric Constant, Dielectric strength, Energy stored in a	20 Lectures 18-04-2022 04-05-2022	Class test on 04-05-2022

		capacitor, Air, Paper, Mica, Teflon, Ceramic, Plastic and Electrolytic capacitor, capacitors in series and parallel Kirchhoff's Current Law (KCL), Kirchhoff's Voltage Law (KVL), Node Analysis, Mesh Analysis RC Circuit, RL Circuit, RLC Circuits Sinusoidal Voltage and Current, Definition of Instantaneous, Peak, Peak to Peak, Root Mean Square and Average Values. Voltage-Current relationship in Resistor, Inductor and Capacitor Passive Filters: Low Pass, High Pass, Band Pass and Band Stop.		
	UNIT 2: Analog Electronics	PN Junction Diode, Construction and characteristics, Zener Diode, Half wave, full wave and bridge rectifier, Clipping and clamping circuit, regulated power supply, basic transistor action, Transistor current components and amplification. Transistor configurations: Common Base (CB), Common Emitter (CE) and Common Collector (CC) configuration, I-V characteristics, Concept of feedback, negative and positive feedback, Negative feedback, advantages and disadvantages of negative feedback, Barkhausen criteria for oscillations	20 Lectures 16-05-2022 08-06-2022	Class test on 08-06-2022
	UNIT 3: Digital Electronics	Decimal, Binary, Hexadecimal and Octal number systems, base conversions, Truth Tables of OR, AND, NOT, XOR, XNOR, Universal (NOR and NAND) Gates, Basic postulates and fundamental theorems of Boolean algebra, Combinational Logic Analysis and Design, Adder, Subtractor, Encoder and Decoder, Multiplexers and Demultiplexers, Sequential logic design, Latches and Flip flops, S-R Flip flop, J-K Flip flop, T and D type Flip flops, Introduction to registers and counters	20 Lectures 09-06-2022 30-06-2022	Class test on 30-06-2022

4<sup>th</sup> SEMESTER

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

(Credit: 4+2=6) (L: 4, P: 4, T: 0) Theory: 60 Lectures, Practical: 60 Lectures

FACULTY NAME	Unit	Topics	AIM TO BE COMPLETED	REMARKS
ABDUL MALIK	UNIT 1: Introduction to object-oriented programming	Origins of C++, Basic Concepts of Object-Oriented Programming, Benefits of OOP, Applications of OOP, Introduction to C++, Structure of a Simple C++ program, Output operator, Input operator, Cascading of I/O operators, Tokens- keyword, identifiers, constants, strings and operators. Basic data types, User defined data types, Dynamic initialization of variables, Reference variables, Operators in C++, Scope resolution operator & applications, Member dereferencing operators, Memory Management operators, new and delete, Control Structures-simple if, if else, nested if, switch, while do, break and continue statements, Introduction to Functions-Function Prototyping, Call by reference, Return by reference, Inline functions, Default arguments, Const arguments.	10 Lectures 18-04-2022 02-05-2022	Class test on 02-05-2022
	UNIT 2:Classes and objects	Introduction - Defining a class-Class Vs structures, Creating objects, Accessing class members, Defining member functions- Outside the class definition, Inside the class definition, Outside functions as inline, Nesting of member functions, Private member functions, Memory allocation for objects, Array-Declaring an array-accessing elements of an array, Array of objects, Friendly functions, Constructors and destructors, Basic Concepts of constructors, Default constructor, Parameterized constructor, Multiple constructors in a class, Constructor with default arguments, Dynamic	12 Lectures 03-05-2022 20-05-2022	Class test on 20-05-2022

		initialization of objects, Copy constructor, Dynamic constructors, Destructors		
	UNIT 3:Function and operator overloading	Overloading Concepts Function Overloading: Functions with different sets of parameters, default and constant parameters, Rules for overloading operators, defining operator overloading, Overloading Unary operators, Prefix and Postfix operators overloading, Overloading Binary operators, overloading relational operators, Overloading using friend functions, Overloading subscript operator, Pitfalls of operator overloading, Type Conversion-Basic to Class, Class to Basic	10 Lectures 21-05-2022 02-06-2022	Class test on 02-06-2022
	UNIT 4:Inheritance	Introduction-Defining derived classes, Types of inheritances, making a private member inheritable, multilevel inheritance, multiple inheritance, Hierarchical inheritance, Hybrid inheritance, Virtual base classes, Abstract classes, Constructors in derived classes, nesting of classes, polymorphism-Compile time and Runtime polymorphism, Pointers to objects, this pointer, Pointer to derived classes, Virtual functions, Rules for virtual functions, Pure virtual functions.	12 Lectures 03-06-2022 20-06-2022	Class test on 20-06-2022
	UNIT 5: Streams	C++ stream classes-put() and get() functions, getline() and write() functions, Overloading << and >>operators, Formatted Console I/O operations, ios class functions-width(), precision(), fill(), setf() and unsetf(), Formatting flags, Manipulators, User defined manipulators.	8 Lectures 21-06-2022 30-06-2022	Class test on 30-06-2022

**BCA-HG-4026: INFORMATION SECURITY AND CYBER LAWS**

(Credit: 5+1=6) (L: 5, P: 0, T: 1) Theory: 60 Lectures, Tutorial: 15 Lectures

FACULTY	Unit	Topics	AIM TO BE	REMARKS
---------	------	--------	-----------	---------

NAME			COMPLETED	
PONKHI BANIKYA	UNIT 1: Course Introduction	Computer network as a threat, hardware vulnerability, software vulnerability, importance of data security	8 Lectures 18-04-2022 27-04-2022	Class test on 27-04-2022
	UNIT 2: Digital Crime	Overview of digital crime, criminology of computer crime	4 Lectures 29-04-2022 03-05-2022	Class test on 03-05-2022
	UNIT 3: Information Gathering Techniques	Tools of the attacker, information and cyber warfare, scanning and spoofing, password cracking, malicious software, session hijacking	8 Lectures 04-5-2022 13-05-2022	Class test on 13-05-2022
	UNIT 4: Risk Analysis and Threat	Risk analysis, process, key principles of conventional computer security, security policies, authentication, data protection, access control, internal vs external threat, security assurance, passwords, authentication and access control, computer forensics and incident response	10 Lectures 14-05-2022 25-05-2022	Class test on 25-05-2022
	UNIT 5: Introduction to Cryptography and Applications	Important terms, Threat, Flaw, Vulnerability, Exploit, Attack, Ciphers, Codes, Substitution Cipher (Caesar), Transposition Cipher (Rail-Fence), Public key cryptography (Definitions only), Private key cryptography (Definition and Example), Cyber forensics, Steganography	10 Lectures 26-05-2022 06-06-2022	Class test on 06-06-2022
	UNIT 6: Safety Tools and Issues	Firewalls, logging and intrusion detection systems, Windows and windows XP / NT security, Unix/Linux security, ethics of hacking and cracking	10 Lectures 07-06-2022 17-06-2022	Class test on 17-06-2022
	UNIT 7: Cyber laws to be covered as per IT 2008	<ul style="list-style-type: none"> <li>• Chapter 1: Definitions</li> <li>• Chapter 2: Digital Signature and Electronic Signature</li> <li>• [Section 43] Penalty and Compensation for damage to computer, computer</li> <li>• [Section 65] Tampering with Computer Source Documents</li> <li>• [Section 66 A] Punishment for sending offensive messages through communication service etc.</li> </ul>	10 Lectures 18-06-2022 29-06-2022	Class test on 29-06-2022

		<ul style="list-style-type: none"> <li>• [Section 66 B] Punishments for dishonestly receiving stolen computer resource or communication device</li> <li>• [Section 66C] Punishment for identity theft</li> <li>• [Section 66D] Punishment for cheating by personating by using computer resource</li> <li>• [Section 66E] Punishment for violation of privacy</li> <li>• [Section 66F] Punishment for cyber terrorism</li> <li>• [Section 67] Punishment for publishing or transmitting obscene material in electronic form</li> <li>• [Section 67A] Punishment for publishing or transmitting of material containing sexually explicit act, etc. in electronic form</li> <li>[Section 67B] Punishment for publishing or transmitting of material depicting children in sexually explicit act, etc. in electronic form</li> <li>• [Section 72] Breach of confidentiality and privacy</li> </ul> <p>10 Lectures</p>		
--	--	--	--	--

**BCA-SE-4034: Advanced Web Technology**

(Credit: 2+2=4) (L: 2, P: 4, T: 0) Theory: 20 Lectures, Practical: 20 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
BULBUL DAS	UNIT 1: Web Development Techniques	Server Side Scripting with PHP: Variable declaration, conditionals and loops, error handling with try-catch, vardump, etc. , Integrating PHP in HTML and vice-versa, understanding popular libraries like Date-Time, Math, String etc., Working with PHP superglobals, PHP-HTML form handling, Session & Cookies, File Handling in PHP, Connection of PHP to MySQL DB, PHP CRUD operation with MySQL DB, Server Side Scripting with JSP: Brief overview of Java, JSP	12 Lectures 18-04-2022 24-05-2022	Class test on 24-05-2022



		Fundamentals – Environment Setup, Syntax, Architecture, Lifecycle, Debugging etc., JSP Form Processing and File Handling, Working with JDBC, Java Beans, Intermediate Web Development Techniques: Understanding AJAX, Working with XML Documents using PHP & JSP, Understanding JSON, JSON parsing and serialization using PHP, JSP and JavaScript		
	UNIT 2: Current Trends in Web Technology	Understanding Popular Architecture Paradigms – MVC, MVP and MVVM, their components and their utilization, Introduction to popular PHP based web Content Management Systems, Wordpress and Drupal (7+), Introduction to MVC paradigm using any open-source PHP framework like Symfony, Laravel etc, Introduction to Server Side JavaScript with NodeJS	8 Lectures 30-05-2022 21-06-2022	Class test on 21-06-2022

### BCA-HC-4016 Computer Organization and Architecture

(Credit: 5+1=6) (L: 5, P: 0, T: 1) Theory: 60 Lectures, Tutorial: 15 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
BULBUL DAS	UNIT 1: Introduction	Functional units of a computer, basic instructions (zero, one, two, three address, interconnection of functional units, bus structure, memory locations, memory addresses, memory operations, instruction and instruction sequencing (straight line sequencing and branching), Fixed and floating point representation of numbers, Normalized floating point representation and arithmetic operations using normalized floating point numbers, IEEE standard for binary floating point representation, Addressing modes, stack, subroutine, I/O instructions	12 Lectures 18-04-2022 30-04-2022	Class test on 30-04-2022

	UNIT 2: Register Transfer Logic	Introduction, inter-register transfer, arithmetic micro-operation, logic micro-operation, shift micro-operation, Conditional control statements, fixed point binary data, instruction code, design of a simple computer.	10 Lectures 02-05-2022 12-05-2022	Class test on 12-05-2022
	UNIT 3: Processor Logic Design	Processor organization, design of arithmetic and logic circuit, status register, design of accumulator.	8 Lectures 13-05-2022 23-05-2022	Class test on 23-05-2022
	UNIT 4: Control Logic Design	Hardware control, micro-programmed control block diagram, symbolic micro-program, microprogrammed CPU organization	8 Lectures 24-05-2022 02-06-2022	Class test on 02-06-2022
	UNIT 5: I/O Subsystem	Program controlled I/O, Interrupts: enabling and disabling interrupts, handling interrupts from multiple sources (priority control), DMA.	12 Lectures 03-06-2022 15-06-2022	Class test on 15-06-2022
	UNIT 6: Memory Subsystem	Semiconductor memory, SRAM, DRAM, ROM, speed size and cost, Cache memory, mapping functions	10 Lectures 16-06-2022 28-06-2022	Class test on 28-06-2022

### BCA-HC-4026 Mathematics-II

(Credit: 5+1=6) (L: 5, P: 0, T: 1) Theory: 60 Lectures, Tutorial: 15 Lectures

DEPT	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
MATHEMATICS	UNIT 1: Sets, Relations and Functions	Sets, relations, properties of binary relations, closures of relation, equivalence relations, equivalence classes and partitions, Partial ordering relations and lattices, Functions, one-to-one and onto, principles of mathematical induction	12 Lectures 18-04-2022 30-04-2022	Class test on 30-04-2022
	UNIT 2: Graph theory	Basic Definition of graph, Connectivity of graph, cut point's cycles, Hamiltonian graphs, trees, different characterization of trees, bipartite graph, Algorithms on graph, Breadth first search, Depth first search	12 Lectures 02-05-2022 14-05-2022	Class test on 14-05-2022
	UNIT 3: Combinatorics	Basic of counting principles, principle of inclusion-exclusion, application of inclusion and exclusion,	10 Lectures 16-05-2022 26-05-2022	Class test on 26-05-2022

		Pigeonhole principle, generalized Pigeonhole principle and its application, permutations and combinations, permutations with repetitions, combinations with repetitions, permutations of sets with indistinguishable objects.		
	UNIT 4: Matrices	Row and column operations, vectors and matrices, partitioning of matrices, representing relations using matrices, Determinant of a square matrix, minor, cofactor, the Cayley-Hamilton theorem, inverse of a matrix, product form of inverse. Rank of a matrix, Solutions of simultaneous linear equations, existence of solutions and solution by Gaussian elimination, Eigen values and Eigen vectors.	8 Lectures 27-05-2022 04-06-2022	Class test on 04-06-2022
	UNIT 5: Logic	Connectives, truth tables, Normal forms- CNF, DNF, Converting expressions to CNF and DNF, Theory of inference, Propositional calculus, Boolean Algebra, Predicate calculus (only introduction), predicates and quantifiers	12 Lectures 06-06-2022 18-06-2022	Class test on 18-06-2022
	UNIT 6: Vector Space	Fields (definition with a few examples), definition and examples of vector spaces, Properties of linearly independent and dependent set of vectors, Basis and dimension of a vector space, Examples of finite dimensional vector spaces Elementary properties of $R^n$ as a vector space	6 Lectures 20-06-2022 07-06-2022	Class test on 07-06-2022

### 6<sup>th</sup> SEMESTER

#### BCA-HC-6016: System Administration using Linux

(Credit: 4+2=6) (L: 4, P: 4, T: 0) Theory: 60 Lectures, Practical: 60 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
BULBUL	UNIT 1:	Introduction to System	8 Lectures	Class test on

DAS	Introduction	Administration, Role and power of System Administrator, Basic Features of the Linux operating system, A brief Overview of the most popular Linux Distributions - Red Hat Enterprise Linux (RHEL), Ubuntu, Debian, Fedora, SUSE), Installation Requirements, Partitioning the Hard drive in Linux, Installing the Linux system, Installing and Configuring software in linux, Linux kernel and device drivers, System Startup and Shutdown. Standard I/O, Standard error, Redirection and Piping	15-02-2023 28-02-2023	28-02-2023
	UNIT 2: Linux file system	Basics of Linux file system - File system types (ext3, ext4, xfs, jfs, ReiserFS, iso9660 etc.), three basic types of files (ordinary or regular, special or device and directory), I-nodes and file attributes, Absolute and Relative path names. File system Mounting and Unmounting, Organization of the file tree, Standard directories and their contents.	12 Lectures 01-03-2023 21-03-2023	Class test on 21-03-2023
	UNIT 3: Basic Linux Commands	Files and Directory handling Commands - ls, cd, cp, mv, rm, mkdir, rmdir, Commands for Creating and Viewing ordinary files – cat, more, pg, Filter Commands – wc, head, tail, cut, tr, grep (with regular expressions), Setting user and group ownership of files and Access permissions – chmod, chown, chgrp commands, Study of different Linux Shells (sh, bash, csh, zsh), Environment variables, Shell script basics (examples of some simple shell programming).	12 Lectures 22-03-2023 11-04-2023	Class test on 11-04-2023
	UNIT 4: Process	Basic commands for starting and stopping processes,	8 Lectures 14-04-2023	Class test on 04-05-2023

	Creation	Basic process attributes and their role in Access control, Examining the list of running processes on the system and understand the data presented there, Background process, Job control, Cron tab file format, Backup and Restore procedure, submit a print job, check the status of a print job, cancel a print job, Configuring the Print Queue, Selecting the Print Driver, Editing the Printer configuration.	04-05-2023	
	UNIT 5: General User Administration	Understanding the „root,, account, becoming a Superuser (su), A limited su (sudo) Managing user accounts - Adding a new user, Modifying and Removing User accounts, Changing Password, System monitoring and logging, Monitoring memory usage, disk space usage and I/O activity.	10 Lectures 08-05-2023 23-05-2023	Class test on 23-05-2023
	UNIT 6: Networking in Linux	The rules governing IP address classes and netmasks, Network Address, Netmask and Gateway, configuring Interface with ifconfig, ping, netstat, traceroute, telnet. Understanding the significance of the /etc/services file and well-known port numbers, Basics of configuring NFS, NIS, DNS, FTP, Squid Proxy, DHCP server, iptables and firewall, Basic Network Security Issues	10 Lectures 24-05-2023 08-06-2023	Class test on 08-06-2023

### BCA-HC-6026: Computer Networks

(Credit: 5+1=6) (L: 5, P: 0, T: 1) Theory: 60 Lectures, Tutorial: 15 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
PONKHI BANIKYA	UNIT 1: Physical Layer	Data communications: components, Network criteria, physical structures, network models, categories of	8 Lectures 15-02-2023 24-02-2023	Class test on 23-02-2023

		networks, interconnection of networks, inter network Protocols and standards: protocols-standards-standards organizations- internet standards Network models: Layered tasks, OSI model, layers in the OSI model, TCP/IP protocol suite.		
	UNIT 2: Digital Transmission	Digital to digital conversion: Line coding, line coding schemes, block coding - analog to digital conversion, PCM, transmission modes: serial transmission, parallel transmission, Analog Transmission: Digital to analog conversion: FSK-ASK-PSK, Analog to Analog conversion: Amplitude modulation, Frequency modulation, phase modulation, Multiplexing: Frequency division multiplexing, Time division multiplexing, Transmission Media Guided media: Twisted pair cable, coaxial cable, fiber optic cable Unguided media: radio waves – microwaves-infrared.	10 Lectures 25-02-2023 09-03-2023	Class test on 09-03-2023
	UNIT 3: Data Link Layer	Error correction and detection: Introduction, block coding, linear block code, cyclic codes checksum, Data link Control: protocols, simplest protocol, stop and wait protocol, stop and wait automatic repeat request, go back n automatic repeat request, selective repeat, automatic repeat request, piggybacking, Multiple Access: Random access, Aloha, CSMA, CSMA/CD, CSMA/CA Controlled access: reservation, polling, token passing, Channelization:FDMA,TDMA ,CDMA.	12 Lectures 10-03-2023 21-03-2023	Class test on 21-03-2023
	UNIT 4: Network Layer	Wired LANs: Ethernet: IEEE standards, standard Ethernet-fast Ethernet, Wireless LANS: IEEE 802.11 architecture, MAC sublayer addressing mechanism, physical layer-Bluetooth: architecture	12 Lectures 22-03-2023 05-04-2023	Class test on 05-04-2023

		Bluetooth layers-radio layer-baseband layer-L2CAP-other upper layers. Network Layer: IPV4 addresses, IPV6 Addresses, Internet Protocol: IPv4 & IPv6 Address mapping protocols: ARP – RARP.		
	UNIT 5: Transport Layer	Routing protocols: Unicast routing protocols: distance vector routing, Link State routing, Multicast Routing protocols (Any two) Transport Layer: Process to process delivery, UDP/ TCP, Congestion control and QOS: Data traffic, congestion, congestion control, quality of service techniques to improve quality of service.	10 Lectures 06-04-2023 20-04-2023	Class test on 20-04-2023
	UNIT 6: Application layer & Network Security	DNS: Name space, domain name space, distribution of name space, Electronic mail Architecture, FILE transfer: FTP WWW and HTTP: Architecture, web documents, HTTP, Network Security: Introduction, definitions, two categories, symmetric key cryptography, traditional ciphers, asymmetric key cryptography	8 Lectures 21-04-2023 02-05-2023	Class test on 02-05-2023

### BCA-HE-6036: Multimedia and Applications

(Credit: 4+2=6) (L: 4, P: 4, T: 0) Theory: 60 Lectures Practical: 60 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
ABDUL MALIK	UNIT 1: Multimedia	Introduction to multimedia, components, uses of multimedia, multimedia applications, virtual reality	6 Lectures 15-02-2023 23-02-2023	Class test on 23-02-2023
	UNIT 2: Text	Fonts & Faces, Using Text in Multimedia, Font Editing & Design Tools, Hypermedia & Hypertext	4 Lectures 27-02-2023 02-03-2023	Class test on 02-03-2023
	UNIT 3: Images	Still Images – bitmaps, vector drawing, 3D drawing & rendering, natural light & colors, computerized colors, color palettes, image file formats.	6 Lectures 06-03-2023 15-03-2023	Class test on 15-03-2023
	UNIT 4: Sound	Digital Audio, MIDI Audio, MIDI vs Digital Audio, Audio File Formats	6 Lectures 16-03-2023 27-03-2023	Class test on 27-03-2023

	UNIT 5: Video	How video works, analog video, digital video, video file formats, video shooting and editing.	8 Lectures 28-03-2023 11-04-2023	Class test on 11-04-2023
	UNIT 6: Animation	Principle of animations, animation techniques, animation file formats.	10 Lectures 12-04-2023 02-05-2023	Class test on 02-05-2023
	UNIT 7: Internet and Multimedia	Www and HTML, multimedia on the web – web servers, web browsers, web page makers and site builders.	6 Lectures 03-05-2023 11-05-2023	Class test on 11-05-2023
	UNIT 8: Making Multimedia	Stages of a multimedia project, Requirements to make good multimedia, Multimedia Hardware Macintosh and Windows production Platforms, Hardware peripherals- Connections, Memory and storage devices, Multimedia software and Authoring tools.	14 Lectures 15-05-2023 06-06-2023	Class test on 06-06-2023

### BCA-HE-6066: Artificial Intelligence

(Credit: 4+2=6) (L: 4, P: 4, T: 0) Theory: 60 Lectures Practical: 60 Lectures

FACULTY NAME	UNIT	TOPICS	AIM TO BE COMPLETED	REMARKS
BULBUL DAS	UNIT 1: Introduction	Introduction to Artificial Intelligence, Background and Applications, Turing Test and Rational Agent approaches to AI, Introduction to Intelligent Agents, their structure, behavior and environment.	6 Lectures 15-02-2023 23-02-2023	Class test on 23-02-2023
	UNIT 2: Problem Solving and Searching Techniques	Problem Characteristics, Production Systems, Control Strategies, Breadth First Search, Depth First Search, Hill climbing and its Variations, Heuristics Search Techniques: Best First Search, A* algorithm, Constraint Satisfaction Problem, Means-End Analysis, Introduction to Game Playing, Min-Max and Alpha-Beta pruning algorithms.	20 Lectures 27-02-2023 03-04-2023	Class test on 03-04-2023
	UNIT 3: Knowledge Representation	Introduction to First Order Predicate Logic, Resolution Principle, Unification, Semantic Nets, Conceptual Dependencies, Frames, and Scripts, Production Rules,	20 Lectures 05-04-2023 10-05-2023	Class test on 09-05-2023



		Conceptual Graphs. Programming in Logic (PROLOG)		
	UNIT 4: Dealing with Uncertainty and Inconsisten cies	Truth Maintenance System, Default Reasoning, Probabilistic Reasoning, Bayesian Probabilistic Inference, Possible World Representations.	8 Lectures 11-05-2023 24-05-2023	Class test on 24-05-2023
	UNIT 5: Understand ing Natural Languages	Parsing Techniques, Context- Free and Transformational Grammars, Recursive and Augmented Transition Nets.	6 Lectures 25-05-2023 05-06-2023	Class test on 05-06-2023