Teaching Plan

For Session: 2024 - 2025

Department Of Computer Applications

Morigaon College

EVEN SEMESTER

2nd SEMESTER

CIT020204: DIGITAL LOGIC FUNDAMENTALS

(Credit: 4) (L: 4, P: 0, T: 0) Theory: 60 Lectures

Faculty Name	Unit	Topics	Aim To Be Completed	Remarks
NISHA PATAR	UNIT 1: Introduction to Binary Number System	Binary numbers, number base conversions, octal and hexa decimal numbers, 1's complement and 2's complement, representation of signed binary number: 1's complement, 2's complement and signed magnitude, subtraction with complements, arithmetic addition and subtraction of signed binary numbers, binary codes: BCD, Excess-3, error detection code: parity bit, error correction code: Hamming code, gray code, ASCII, EBCDIC, binary logic, logic gates: AND, OR, inverter, buffer, NAND, NOR, XOR and equivalence.	10 Lectures 03-03-2025 to 13-03-2025	Sessional Examination 22-04-2025 To 24-04-2025
	UNIT 2: Boolean Algebra, Logic Gates and Integrated Circuits	Definition of boolean algebra, two valued boolean algebra, duality principle, theorems and postulates of boolean algebra, precedence of boolean operators, boolean expression and Venn diagram, boolean functions and truth tables, complement of a boolean function, minterms and maxterms, canonical forms of a boolean function, sum of minterms and its short notation, product of maxterms and its short notation, conversion between canonical forms, standard form of a boolean function, digital logic gates, integrated circuits and levels of integration, digital logic families	15 Lectures 17-03-2025 to 29-03-2025	
	UNIT 3: Simplification of Boolean Functions	Map minimization method, two variable map, three variable maps, four variable map, five variable map, NAND and NOR implementation of boolean	10 Lectures 02-04-2025 to 12-04-2025	

		functions, don't-care conditions, tabulation method		
	UNIT 4: Combinational Circuits	Definition of combinational circuit, design procedure, half adder, full adder, half subtractor, full subtractor, BCD-to-Excess-3 code converter, encoders and decoders, multiplexers, ROM	12 Lectures 25-04-2025 to 08-05-2025	
	UNIT 5: Sequential circuits	Flip flops, RS flip flop, D flip flop, JK flip flop, T flip flop, master slave flip flops and edge triggered flip flops, state table of a sequential circuit, state diagram, characteristic tables of flip flops, Mealy and Moore machine, flip flop excitation tables, design procedure of clocked sequential circuit, 3-bit binary counter, shift register, ripple counter, RAM	13 Lectures 12-05-2025 to 26-05-2023	

CIT020104: DATA STRUCTURE AND ALGORITHMS USING C

(Credit: 4) (L: 3, P: 1, T: 0) Theory: 45 Lectures, Practical: 35 Classes

Faculty Name	Unit	Topics	Aim To Be Completed	Remarks
Nabanika Sarkar	UNIT 1: Data Structures Overview and Arrays	Concepts of Data Types, Abstract Data Type, Data Structure, Fundamental and Derived Data Types. Importance of data structures. Array as a data structure (characteristics, advantages, disadvantages). Representation of arrays – single and multidimensional. Address calculation of array element using column and row major ordering. Address translation functions for one & two dimensional arrays. Insertion and deletion in arrays. Use of arrays for large number representation.	8 Lectures 17-02-2025 to 25-02-2022	Sessional Examination 22-04-2025 To 24-04-2025
	UNIT 2: Linked Lists	Initialization and implementation of structures. Structure and pointers. Self referential structure. Introduction to linked lists. Singly linked list, doubly linked list, circular linked list. Operations on lists – creation, insertion, deletion, traversal, merging and splitting.	9 Lectures 27-02-2025 to 07-03-2025	

		Array of structures and Structure of Arrays. Array of lists and List of lists.		
	UNIT 3: Stacks and Queues	Definition of Stack and Queue. Representation of stacks and queues using arrays and linked lists. Stack operations – push, pop. Queue operation – enqueue, dequeue. Circular Queue, Priority Queue, Conversion of infix arithmetic expression containing arithmetic operators and parenthesis to postfix and prefix expression. Evaluation of postfix expression.	9 Lectures 10-03-2025 to 21-03-2025	
	UNIT 4: Binary Trees	Definition of Trees – General tree and Binary tree. Basic terminologies – parent, child, height, depth, leaf, node, internal nodes, external nodes. Brief concept of Forest, ordered trees, strictly binary tree, complete binary tree. Representation of trees using arrays and linked lists. Binary tree traversal methods – pre-order, in-order, post-order. Recursive and non-recursive algorithms for traversal methods. Binary search trees. Operation on BST – creation, insertion and deletion of a node. Definition and characteristics of threaded binary trees, multi-way search trees. Breadth First Search, Depth First Search. Min heap and Max heap.	8 Lectures 24-03-2025 to 10-04-2025	
	UNIT 5: Searching and Sorting	Linear and binary search. Indexed search. Hashing. Hash Functions – division method, mid square method, folding. Conflict resolution – linear and quadratic probe. Sorting algorithms – Insertion sort, Selection sort, Bubble sort, Merge sort, Quick sort, Counting sort, Heap sort. In-place sorting and stable sorting.	6 Lectures 25-04-2025 to 05-05-2025	
	UNIT 6: Analysis of Algorithm and Complexity	Complexity measures of an algorithm – Time and space complexity. Average case and worst case analysis. Asymptotic notation as a measure of algorithm complexity, O and θ notations. Analysis of sorting algorithms and Searching algorithms in terms of time and space complexity in best, average and worst case..	5 Lectures 07-05-2025 to 14-05-2025	

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: 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 24-02-2025 to 03-03-2025	Sessional Examination 22-04-2025
	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 04-03-2025 To 22-03-2025	
	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 25-03-2025 to 10-04-2025	
	UNIT 4: Java Script	Client side Scripting languages, creating interactive documents using JavaScript	10 Lectures 05-05-2025 to 16-05-2025	

4th SEMESTER

CIT040104: Database Management System

(Credit: 4) (L: 3, P: 1) Theory: 45 Lectures, Practical: 30 Classes

Faculty Name	Unit	Topics	Aim To Be Completed	Remarks
HARSHITA HAZARIKA	UNIT 1: Introduction to Database Management Systems	Basic Definition and Concepts: Data, Information, Meta Data, Data Dictionary, Database, Fields, Records and Files. Definition of Database Management System (DBMS), Primary Functions of DBMS, Traditional File approach, Traditional file approach versus database management system approach, Disadvantages of Traditional File System, Need of a DBMS, Components of a DBMS, Advantages of DBMS, Disadvantages of Database Systems, Various uses of database System Applications, Database Users: End users or naive users, Onlineusers, ApplicationProgrammers, DatabaseAdministrator(DBA), Responsibilities of DBA.	10 Lectures	
	UNIT 2: Database Management System Architecture	Definition of Schemas, sub-schema and Instances. Data Independence: Physical Data Independence and Logical data Independence. Three-tier architecture of DBMS, Advantages of three-level Architecture, basic concept of data model, Characteristics of Data Models, Types of Data models: Record Based Data Models, Object Based Data Model and Physical Data Models. Relational Data Model, Types of database Systems: Single-user database systems, Multiuser database systems, Centralized database systems, Distributed database systems and Client/Server database systems.	12 Lectures	
	UNIT 3: E-R Modeling	Basic Concepts: Entity, Attributes, Entity Sets, Domain. Types of attributes: Simple and Composite Attributes, Single Valued and Multi-valued Attributes, Derived Attributes and Stored Attributes. Types Of	10 Lectures	

		Entity Sets:Strong Entity Sets and Weak Entity Sets. Concept of Relationship and Relationship sets, Types of Relationship: One-to-One, One-to-Many, Many-to-One and Many-to Many, Various Symbols used in ER Diagram, Mapping constraints: MappingCardinalities(Cardinality Ratios) and ParticipationConstraints. Definition of Key, Types of Keys: SuperKey, Candidate Key, Primary Key, Alternate Key and Foreign Key. Symbols used in E-R diagrams, Conversion of an ER and Diagram in to Relational Tables		
	UNIT 4: Relational Model and Relational Algebra	Definition of Relation, Data Structure of Relational Database: Relation, Tuples, Attributes Domain, Degree and Cardinality.Integrity Constraints, Domain Constraints, Key Constraints, Advantages and Disadvantages of Relational Model, Relational, Definition of Relational algebra, Operations in Relational Algebra: Selection, Projection, Division, Rename, Union, Intersection, Set Difference, Natural-join operation, Outer join, Inner Join, Cartesian Product and Assignment operation. Aggregate Functions and Operations: Average, Maximum, Minimum, Sum and Count.	12 Lectures	
	UNIT 5: Functional Dependency and Normalization	Definition of Functional Dependency, Armstrong's Axioms in Functional Dependency, Types of Functional Dependency: Partial Dependency, Full Functional Dependency, Transitive and Non-transitive Functional Dependency,Armstrong's Axiom, Closure of a set of Functional Dependency, Closure of an Attribute,Definition of Canonical Cover, Algorithmto find the canonical cover of a FD set, Anomalies in relational database: Insertion, Deletion and Update anomalies, Concepts of Normalization, Benefits of Normalization, Types of Normal Forms: First Normal Form (1NF), Second Normal Form (2NF), Third Normal Form (3NF) and	8 Lectures	

		Boyce–Codd Normal Form (BCNF)		
	UNIT 6: Transaction and Concurrency Control	Definition of Transaction, ACID Properties of transaction, Transaction States, Definition of Concurrency Control, Need of Concurrency Control, The Lost Update Problem, The Uncommitted Dependency Problem, The Inconsistent Analysis Problem, Serializability: View Serializability and Conflict Serializability	4 Lectures	
	UNIT 7: SQL Queries	Database Languages (Data Definition Languages, Data Manipulation Languages), Characteristics of SQL, Basic data types in SQL, Data-definition language (DDL) commands: Create Database, Create Table, Drop Table, Alter Table. SQL Constraints: Primary Key, Foreign Key, Not Null, Unique, Check, Defaul,.Data Manipulation Language (DML) commands: Insert Into, Delete, Select, Update. SQL clauses: Where, Order By, Having, Group By and Like. SQL join operations: Inner Join, Left Outer Join, Right Outer Join and Full Join. SQL aggregate functions: sum(), count(), max(), min() and avg()	7 Lectures	

CIT040204: Operating System

(Credit: 4) (L: 3, P: 1) Theory: 45 Lectures, Practical: 30 Classes

Faculty Name	Unit	Topics	Aim To Be Completed	Remarks
NISHA PATAR	UNIT 1: Introduction	Application vs system software, operating system as system software, operating structure structure, types of operating systems: batch operating system, multiprogramming operating system, multi tasking operating system, distributed operating system, real time operating system, multi user operating system, major functions of operating system: Process Management, Process	10 Lectures	

		Synchronization, Memory Management, CPU Scheduling, File Management, I/O Management, Security, virtualization, cloud computing, open source operating system, history of operating system, the shell, system call, system boot		
	UNIT 2: Process and threads	Process, process states: new, running, waiting, ready and terminated, Process Control Block (PCB), information stored in PCB, scheduling queue: job queue, ready queue and device queue, schedulers: long term schedulers, medium term scheduler and long term scheduler, swapping, degree of multiprogramming, I/O-bound and CPU-bound processes, context switching, inter-process communication: shared memory systems and message passing systems, socket, remote procedure call, threads, user threads, kernel threads, multi threading models: Many-to-One Model, One-to-One Model, Many-to-Many Model, CPU scheduling, Scheduling Criteria, scheduling algorithms: First Come, First-Served Scheduling, Shortest-Job-First Scheduling, Priority Scheduling, Round-Robin Scheduling, Multilevel Queue Scheduling, Multilevel Feedback Queue Scheduling	12 Lectures	Sessional Examination 22-04-2025
	UNIT 3: Process synchronization	Race condition, critical section problem, Peterson's algorithm, Bakery algorithm, synchronization hardware: locking, synchronization software tools: mutex lock, semaphore (counting and binary), semaphore implementation, classic synchronization problems: bounded buffer problem, the readers –writers Problem, the dining-philosophers problem, monitor, synchronization in windows, synchronization in linux	10 Lectures	
	UNIT 4: Deadlock	Deadlock, operations of a process performs while using a resource: Request. Use and Release, physical and logical resources, Necessary conditions: mutual	12 Lectures	

		exclusion, hold & wait, no preemption and circular wait, resource allocation graph, deadlock prevention: definition, preventing mutual exclusion, preventing hold & wait, preventing no preemption and preventing circular wait, deadlock avoidance: definition, safe state, safe sequence, resource allocation graph based algorithm and Banker's algorithm, deadlock detection: definition, wait-for graph, algorithm to detect deadlock for single instance resources, algorithm to detect deadlock for multiple instance resources and recovery from deadlock: process termination and resource pre-emption		
	UNIT 5: Memory Management	Memory hierarchy, base register, limit register, address binding, logical and physical address spaces, memory management unit, relocation register, swapping, contiguous memory allocation: definition, memory protection, fixed partition scheme, variable partition scheme, first-fit, best-fit & worst-fit allocation strategies, non-contiguous memory allocation: simple paging and simple segmentation, internal and external fragmentation, TLB, virtual memory, demand paging, page fault, locality of reference principle, performance of demand paging, page replacement algorithms: FIFO, Optimal and LRU, allocation of frames: equal allocation and proportional allocation, global and local page replacement algorithms, thrashing	8 Lectures	

CIT040304: Automata Theory and Languages

(Credit: 4) (L: 4, P: 0) Theory: 45 Lectures, Practical: 30 Classes

Faculty Name	Unit	Topics	Aim To Be Completed	Remarks
	UNIT 1:	Application vs system software, operating system as system	10 Lectures	

Nabanika Sarkar	Introduction	software, operating structure structure, types of operating systems: batch operating system, multiprogramming operating system, multi tasking operating system, distributed operating system, real time operating system, multi user operating system, major functions of operating system: Process Management, Process Synchronization, Memory Management, CPU Scheduling, File Management, I/O Management, Security, virtualization, cloud computing, open source operating system, history of operating system, the shell, system call, system boot		
	UNIT 2: Process and threads	Process, process states: new, running, waiting, ready and terminated, Process Control Block (PCB), information stored in PCB, scheduling queue: job queue, ready queue and device queue, schedulers: long term schedulers, medium term scheduler and long term scheduler, swapping, degree of multiprogramming, I/O-bound and CPU-bound processes, context switching, inter-process communication: shared memory systems and message passing systems, socket, remote procedure call, threads, user threads, kernel threads, multi threading models: Many-to-One Model, One-to-One Model, Many-to-Many Model, CPU scheduling, Scheduling Criteria, scheduling algorithms: First Come, First-Served Scheduling, Shortest-Job-First Scheduling, Priority Scheduling, Round-Robin Scheduling, Multilevel Queue Scheduling, Multilevel Feedback Queue Scheduling	12 Lectures	Sessional Examination 22-04-2025
	UNIT 3: Process synchronization	Race condition, critical section problem, Peterson's algorithm, Bakery algorithm, synchronization hardware: locking, synchronization software tools: mutex lock, semaphore (counting and binary), semaphore implementation, classic synchronization problems: bounded buffer problem, the	10 Lectures	

		readers –writers Problem, the dining-philosophers problem, monitor, synchronization in windows, synchronization in linux		
	UNIT 4: Deadlock	Deadlock, operations of a process performs while using a resource: Request. Use and Release, physical and logical resources, Necessary conditions: mutual exclusion, hold & wait, no preemption and circular wait, resource allocation graph, deadlock prevention: definition, preventing mutual exclusion, preventing hold & wait, preventing no preemption and preventing circular wait, deadlock avoidance: definition, safe state, safe sequence, resource allocation graph based algorithm and Banker's algorithm, deadlock detection: definition, wait-for graph, algorithm to detect deadlock for single instance resources, algorithm to detect deadlock for multiple instance resources and recovery from deadlock: process termination and resource pre-emption	12 Lectures	
	UNIT 5: Memory Management	Memory hierarchy, base register, limit register, address binding, logical and physical address spaces, memory management unit, relocation register, swapping, contiguous memory allocation: definition, memory protection, fixed partition scheme, variable partition scheme, first-fit, best-fit & worst-fit allocation strategies, non-contiguous memory allocation: simple paging and simple segmentation, internal and external fragmentation, TLB, virtual memory, demand paging, page fault, locality of reference principle, performance of demand paging, page replacement algorithms: FIFO, Optimal and LRU, allocation of frames: equal allocation and proportional allocation, global and local page replacement algorithms, thrashing	8 Lectures	

CIT040404: Python Programming

(Credit: 4) (L: 3, P: 1) Theory: 45 Lectures, Practical: 30 Classes

Faculty Name	Unit	Topics	Aim To Be Completed	Remarks
NISHA PATAR	UNIT 1: Introduction	Application vs system software, operating system as system software, operating structure structure, types of operating systems: batch operating system, multiprogramming operating system, multi tasking operating system, distributed operating system, real time operating system, multi user operating system, major functions of operating system: Process Management, Process Synchronization, Memory Management, CPU Scheduling, File Management, I/O Management, Security, virtualization, cloud computing, open source operating system, history of operating system, the shell, system call, system boot	10 Lectures	
	UNIT 2: Process and threads	Process, process states: new, running, waiting, ready and terminated, Process Control Block (PCB), information stored in PCB, scheduling queue: job queue, ready queue and device queue, schedulers: long term schedulers, medium term scheduler and long term scheduler, swapping, degree of multiprogramming, I/O-bound and CPU-bound processes, context switching, inter-process communication: shared memory systems and message passing systems, socket, remote procedure call, threads, user threads, kernel threads, multi threading models: Many-to-One Model, One-to-One Model, Many-to-Many Model, CPU scheduling, Scheduling Criteria, scheduling algorithms: First Come, First-Served Scheduling, Shortest-Job-First Scheduling, Priority Scheduling, Round-Robin Scheduling, Multilevel Queue Scheduling, Multilevel	12 Lectures	

		Feedback Queue Scheduling		
	UNIT 3: Process synchronization	Race condition, critical section problem, Peterson's algorithm, Bakery algorithm, synchronization hardware: locking, synchronization software tools: mutex lock, semaphore (counting and binary), semaphore implementation, classic synchronization problems: bounded buffer problem, the readers –writers Problem, the dining-philosophers problem, monitor, synchronization in windows, synchronization in linux	10 Lectures	
	UNIT 4: Deadlock	Deadlock, operations of a process performs while using a resource: Request. Use and Release, physical and logical resources, Necessary conditions: mutual exclusion, hold & wait, no preemption and circular wait, resource allocation graph, deadlock prevention: definition, preventing mutual exclusion, preventing hold & wait, preventing no preemption and preventing circular wait, deadlock avoidance: definition, safe state, safe sequence, resource allocation graph based algorithm and Banker's algorithm, deadlock detection: definition, wait-for graph, algorithm to detect deadlock for single instance resources, algorithm to detect deadlock for multiple instance resources and recovery from deadlock: process termination and resource pre-emption	12 Lectures	
	UNIT 5: Memory Management	Memory hierarchy, base register, limit register, address binding, logical and physical address spaces, memory management unit, relocation register, swapping, contiguous memory allocation: definition, memory protection, fixed partition scheme, variable partition scheme, first-fit, best-fit & worst-fit allocation strategies, non-contiguous memory allocation: simple paging and simple segmentation, internal and external fragmentation, TLB, virtual memory, demand paging,	8 Lectures	

		page fault, locality of reference principle, performance of demand paging, page replacement algorithms: FIFO, Optimal and LRU, allocation of frames: equal allocation and proportional allocation, global and local page replacement algorithms, thrashing		

6th 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 DAS	UNIT 1: Introduction	Introduction to System 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	8 Lectures	Sessional Examination 22-04-2025
	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	
	UNIT 3:	Files and Directory handling	12 Lectures	

	Basic Linux Commands	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).		
	UNIT 4: Process Creation	Basic commands for starting and stopping processes, 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.	8 Lectures	
	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	
	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.	10 Lectures	

		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		

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
HARSHITA HAZARIKA	UNIT 1: Physical Layer	Data communications: components, Network criteria, physical structures, network models, categories of 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.	8 Lectures	Shall be planned in accordance with the next academic session.
	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	
	UNIT 3: Data Link	Error correction and detection: Introduction, block coding, linear block code, cyclic codes	12 Lectures	

	Layer	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.		
	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 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.	12 Lectures	
	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	
	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	

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
HARSHITA HAZARIKA	UNIT 1: Multimedia	Introduction to multimedia, components, uses of multimedia, multimedia applications, virtual reality	6 Lectures	Shall be planned in accordance with the next academic session.
	UNIT 2: Text	Fonts & Faces, Using Text in Multimedia, Font Editing & Design Tools, Hypermedia & Hypertext	4 Lectures	
	UNIT 3: Images	Still Images – bitmaps, vector drawing, 3D drawing & rendering, natural light &colors, computerized colors, color palettes, image file formats.	6 Lectures	
	UNIT 4: Sound	Digital Audio, MIDI Audio, MIDI vs Digital Audio, Audio File Formats	6 Lectures	
	UNIT 5: Video	How video works, analog video, digital video, video file formats, video shooting and editing.	8 Lectures	
	UNIT 6: Animation	Principle of animations, animation techniques, animation file formats.	10 Lectures	
	UNIT 7: Internet and Multimedia	Www and HTML, multimedia on the web – web servers, web browsers, web page makers and site builders.	6 Lectures	
	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	

BCA-HE-6066: Artificial Intelligence

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

FACULTY	UNIT	TOPICS	AIM TO BE	REMARKS

NAME			COMPLETED	
NABANIKA SARKAR	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	Shall be planned in accordance with the next academic session.
	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	
	UNIT 3: Knowledge Representation	Introduction to First Order Predicate Logic, Resolution Principle, Unification, Semantic Nets, Conceptual Dependencies, Frames, and Scripts, Production Rules, Conceptual Graphs. Programming in Logic (PROLOG)	20 Lectures	
	UNIT 4: Dealing with Uncertainty and Inconsistencies	Truth Maintenance System, Default Reasoning, Probabilistic Reasoning, Bayesian Probabilistic Inference, Possible World Representations.	8 Lectures	
	UNIT 5: Understanding Natural Languages	Parsing Techniques, Context-Free and Transformational Grammars, Recursive and Augmented Transition Nets.	6 Lectures	

Sarkar

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