Department of Computer Science
Lesson Plan Session 2023-2024
BACS Semester-VI

Computer Graphics (BACS-321)

January 2024 to April 2024	Topics
1st Week	Introduction: Historical perspective of Computer Graphics, Basic elements of Computer graphics,
2nd week	(Modelling, Rendering, Animation), Applications of Computer Graphics,
3rd Week	Input Devices: Keyboard, Mouse, Light Pen, Graphic Tablets, Joysticks, Trackball, Flatbed Scanner
4th Week	Hard Copy Devices: Laser Printer, Flatbed Plotters
5th Week	Video Display Devices: Pixel, Resolution, Aspect Ratio, Refresh Rate and Interlacing. Cathode Ray Tube
6th Week	Flat Panel Display-LCD and Plasma Panel. Raster and Random scan display system
7th Week	Fundamental Techniques in Graphics: Line Generation Algorithms-DDA Algorithm, Bresenham's Line Generation Algorithm
8th Week	Circle Generation Algorithms- Bresenham's Algorithm and Midpoint Circle Algorithm. Polygon Filling Algorithms-Scan Line Algorithm.
9th Week	Viewing & Clipping-Point Clipping and Line Clipping, Cohen-Sutherland Line Clipping Algorithm. Polygon Clipping (Sutherland Hodgman Algorithm)
10th Week	2-Dimensional Graphics: Cartesian and Homogeneous Co-ordinate System,
11th Week	Geometric Transformations (Translation, Scaling, Rotation, Reflection).
12th Week	3-Dimensional Graphics: Geometric Transformations (Translation, Scaling, Rotation, Reflection), Mathematics of Projections (Parallel & Perspective).
13th Week	Doubt Clearance

Department of Computer Science
Lesson Plan Session 2023-2024
BACS Semester-VI

PYTHON PROGRAMMING (BACS-322)

January 2024 to April 2024	Topics
1st Week	Introduction to Python: History and Features of Python Programming, Python Interpreter, Variable, identifier and literal. Token, Keywords, Data Types, Arithmetic Operators, Relational Operators
2nd week	Logical Operator, Bitwise Operator, Assignment Operator, Membership Operator, Identity Operator. Operator Precedence. Comment, Indentation, Need for Indentation
3rd Week	Built-in Functions: input, eval, composition, print, type, round, min and max, pow. Type conversion, Random Number generation. Mathematical Function. Getting help on a function, Assert Statement
4th Week	Control Statements: if Conditional Statement, for and while Statements. break, continue and pass statements.
5th Week	Functions: Function Definition and Call, Function Arguments-Variable Function Arguments, Default Arguments, Keyword Arguments, Arbitrary Arguments. Command Line Arguments.
6th Week	Global and local Variables. Accessing local variable outside the scope, Using Global and Local variables in same code, Using Global variable and Local variable with same Name.
7th Week	Strings: String as a compound data type. String operations-Concatenation, Repetition, Membership operation, Slicing operation. String methods-count, find, rfind, capitalize, title, lower, upper, swapcase, islower, isupperistitle, replace, isalpha, isdigit, isalnum. String Processing examples.
8th Week	Lists: List operations-multiplication, concatenation, length, indexing, slicing, min, max, sum, membership operator; List functions-append, extend, remove, pop, count, index, insert, sort, reverse.
9th Week	Recursion: Recursive solutions for problems on Numbers, String and list.
10th Week	Object Oriented Programming: Introduction to Classes, Method, Class object, Instance object, Method object.
11th Week	Class as abstract data type, Date Class. Access attributes using functions-getattr, hasattr, setattr, delattr. Built-In Class Attributes of Class object (__dict__, __doc__ , __name__, module__).
12th Week	Graphics: Screen Objects- Point and line, box, polygon, circle, arc. Screen Object Methodsmove_to(),move_by(),rotate_by(),Text().Sound-Sound(),play_sound(),stop_sound().
13th Week	Doubt Clearance

Department of Computer Science
Lesson Plan Session 2023-2024
BACS Semester-IV

Computer Networks (BACS-205)

January 2024 to April 2024	Topics
1st Week	Introduction to Computer Communications and Networking Technologies, Uses of Computer Networks
2nd week	Network Devices, Nodes, and Hosts, Types of Computer Networks and their Topologies
3rd Week	OSI Reference Model, TCP/IP Reference Model.
4th Week	Analog and Digital Communications Concepts: Representing Data as Analog Signals, Representing Data as Digital Signals
5th Week	Data Rate and Bandwidth, Capacity, Baud Rate; Digital Carrier Systems; Guided and Wireless Transmission Media; Communication Satellites
6th Week	Switching and Multiplexing.
7th Week	Data Link Layer: Framing, Flow Control, Error Control, Error Detection and Correction, Sliding Window Protocols
8th Week	Media Access Control, Random Access Protocols, Token Passing Protocols, Token Ring
9th Week	Ethernet, gigabit Ethernet, token ring, FDDI, Bluetooth and Wi-Fi
10th Week	Network Layer and Routing Concepts: Virtual Circuits and Datagrams, Routing Algorithms, Flooding
11th Week	Shortest Path Routing, Distance Vector Routing, Link State Routing, Hierarchical Routing
12th Week	Congestion Control Algorithms, Internetworking, IPV4 and IPV6.
13th Week	Doubt Clearance

Department of Computer Science
Lesson Plan Session 2023-2024
BACS Semester-IV

Software Engineerng (BACS-204)

January 2024 to April 2024	Topics
1st Week	Introduction: Program vs. Software, Software Engineering paradigms, Software Crisis – problem and causes.
2nd week	Phases in Software development: Requirement, Analysis, Software Design, Coding, Testing, Maintenance.
3rd Week	Software Development Process Models: Waterfall, Prototype, Evolutionary and Spiral models.
4th Week	Software Requirement Analysis and Specifications: Feasibility Study Software Requirements
5th Week	Need for SRS, Characteristics of an SRS, Components of an SRS, Structure of a requirements document
6th Week	validation and metrics. Problem Analysis, Data Flow Diagram, Data Dictionary, Decision table, Decision trees
7th Week	Software Project Planning: Process Planning, Effort estimation, COCOMO model, Project scheduling and Staffing, team structure, Software configuration management
8th Week	Quality assurance plans, Risk Management, Project monitoring plans.
9th Week	Software Implementation and Maintenance: Type of maintenance, Management of Maintenance, Maintenance Process, maintenance characteristics.
10th Week	Testing: Testing fundamentals, Error, Fault, and Failure, Test Oracle, Test Case and Test Criteria, Psychology of testing
11th Week	Black Box Testing, Equivalence Class Partitioning, Boundary value analysis, Cause effect graphing, White box testing , Control flow based criteria
12th Week	level of testing, Unit testing, Integration testing, System testing, Validation testing, alpha, beta, and Acceptance testing.
13th Week	Doubt Clearance

Department of Computer Science
Lesson Plan Session 2023-2024
BACS Semester-II

Data Structure Using C (BACS-121)

January 2024 to April 2024	Topics
1st Week	Introduction to Complexity, Introduction to Data Structures, Classification of data structure, Abstract data type; Data Structure Operations, Applications of Data Structure.
2nd week	Definition of array, Single and Multi-dimensional Arrays, Representation of single and 2dimentional arrays and their address calculation, basic operations on single dimensional arrays, Algorithm for insertion and deletion operations; Sparse Matrices and its representation.
3rd Week	Definition of stack, Operations on stack, Algorithms for push and pop operations using array. Stack Applications: Prefix, Infix and Postfix expressions, Conversion of Infix expressions to Postfix expression using stack; Recursion
4th Week	Introduction to Queue. Operations on Queues, Circular queue, Algorithm for insertion and deletion in simple queue and circular queue using array.
5th Week	De-queue, Priority Queues, Introduction, Array vs Linked list; Singly, Doubly and Circular linked Lists and representation of linked lists in memory.
6th Week	Implementation of Stack and simple Queue as single Linked List.
7th Week	Introduction to Tree as a data structure, Basic Terminology; Binary Trees, Traversal of binary trees: Inorder, Pre-order & post-order.
8th Week	Binary tree non recursive traversal algorithms. Binary Search Tree, (Creation, and Traversals of Binary Search Trees)
9th Week	Introduction, Memory Representation, Graph Traversal (DFS and BFS)
10th Week	Binary and Linear Search
11th Week	Bubble sort, Insertion sort, Selection sort,
12th Week	Merge Sort, Quick sort. Comparison of various Searching and Sorting algorithms.
13th Week	Doubt Clearance

Department of Computer Science
Lesson Plan Session 2023-2024
BACS Semester-II

Computer Organization (BACS-122)

January 2024 to April 2024	Topics
1st Week	Number Systems: Decimal, Binary, Octal, Hexadecimal, Conversion from one number system to other; Binary arithmetic operations
2nd week	Representation of Negative Numbers: 1's complement and 2's complement; fixed and floating point representation,
3rd Week	character representation (BCD, EBCDIC and ASCII Code), BCD number system; Weighted Codes, Self Complementing Code, Excess-3 code, Gray and Cyclic code.
4th Week	Introduction, Definition, Postulates of Boolean Algebra, Fundamental Theorems of Boolean Algebra; Duality Principle, Demorgan's Theorems, Boolean Expressions and Truth Tables, Standard SOP and POS forms, Canaonical representation of Boolean expressions
5th Week	Simplification of Boolean Expressions using theorems of Boolean algebra, Minimization Techniques for Boolean Expressions using Karnaugh Map
6th Week	AND, OR, NOT, NOR, NAND & XOR Gates and their Truth tables.
7th Week	Half Adder & Full Adder, Half Subtractor & Full Subtractor, Adder & Subtractor, decoders, multiplexors. Realization of Boolean expressions using decoders and multiplexor.
8th Week	Flip-Flops, Types- RS, T, D, JK and Master-Salve JK flip flop, Triggering of Flip Flops
9th Week	Flip Flop conversions, Shift Registers, Synchronous and Asynchronous Counters.
10th Week	Register Organization, Bus system, instruction set, timing and control, instruction cycle, memory reference, input-output and interrupt
11th Week	Programming the Basic Computer: Instruction formats, addressing modes, instruction codes
12th Week	Peripheral devices, I/O interface, Modes of data transfer, Direct Memory Access.
13th Week	Doubt Clearance