BHAGWAN PARSHURAM INSTITUTE OF TECHNOLOGY

LESSON PLAN

Course & Branch: B.Tech (IT) **Semester: 3rd** **Credits: 4**
Paper Code: CIC-209 **Paper Name: Data Structures**

Course Outcomes (COs)	
CO 1	To be able to understand difference between structured data and data structure
CO 2	To be able to create common basic data structures and trees
CO 3	To have a knowledge of sets, heaps and graphs
CO 4	To have basic knowledge of sorting and searching algorithms

S. No.	Topics	No. of Lectures	CO(s)
	Unit - I		
1.	Overview of data structure, Abstract Data Types	1	1
2.	Basics of Algorithm Analysis including Running Time Calculations	2	1
3.	Arrays, Arrays and Pointers, Multidimensional Arrays	1	1, 2
4.	String processing	2	1, 2
5.	General Lists and List ADT, List manipulations, Single, double and circular lists.	2	2
6.	Stacks and Stack ADT, Stack Manipulation	1	2
7.	Prefix, infix and postfix expressions, recursion	1	2
8.	Queues and Queue ADT, Queue manipulation	1	2
	Unit - II		
9.	Sparse Matrix Representation (Array and Link List representation) and arithmetic (addition, subtraction and multiplication)	2	1, 2
10.	Polynomials and polynomial arithmetic	1	2
11.	Trees, Properties of Trees, Binary trees, Binary Tree traversal, Tree manipulation algorithms, Expression trees and their usage, binary search trees	3	2
12.	AVL Trees	2	2
13.	Heaps and their implementation	1	3
14.	Priority Queues, B-Trees, B* Tree, B+ Tree	2	2
	Unit - III		
15.	Sorting concept, order, stability, Selection sorts (straight, heap)	1	3, 4
16.	Insertion sort (Straight Insertion, Shell sort)	2	4
17.	Exchange Sort (Bubble, quicksort)	2	4
18.	Merge sort (External Sorting) (Natural merge, balanced merge and polyphase merge)	2	4
19.	Searching – List search, sequential search, binary search	1	4
20.	Hashing methods, collision resolution in hashing	3	4
	Unit - IV		
21.	Disjoint sets representation, union find algorithm	2	3
22.	Graphs, Graph representation	2	3
23.	Graph Traversals and their implementations (BFS and DFS)	2	3
24.	Minimum Spanning Tree algorithms (Prim's and Krushkal's)	2	3
25.	Shortest Path Algorithms	2	3

Textbook(s):

1. Richard Gilberg , Behrouz A. Forouzan, “Data Structures: A Pseudocode Approach with C, 2nd Edition, Cengage Learning, Oct 2004
2. E. Horowitz, S. Sahni, S. Anderson-Freed, "Fundamentals of Data Structures in C", 2nd Edition, Silicon Press (US), 2007.

References:

1. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, 2nd Edition, Pearson, September, 1996
2. Robert Kruse, “Data Structures and Program Design in C”, 2nd Edition, Pearson, November, 1990
3. Seymour Lipschutz, “Data Structures with C (Schaum's Outline Series)”, McGrawhill, 2017
4. A. M. Tenenbaum, “Data structures using C”. Pearson Education, India, 1st Edition 2003.
5. Weiss M.A., “Data structures and algorithm analysis in C++”, Pearson Education, 2014.

CIC-212: Java Programming (4th Semester)
Lecture Plan

S.No	Topics to be covered	Lectures
	UNIT-I (Assignment -1)	
1	Java Course Outcomes discussion, Introduction, History of Java	2
2	Features of Java, Java program Compilation and Execution Relationship among – JVM, JRE and JDK JVM as an interpreter and emulator	3
3	Instruction Set, class File Format, Verification, Class Area, Java Stack, Heap, Garbage Collection and Class loaders.	3
4	Security Issues – Sandbox Model, Security Architecture and Security Policy. and security aspects	3
	UNIT-II (Assignment -II)	
5	Primitive Data Types, Literals, Dynamic Initialization, Variables, Type conversion, Promotion Rules, Wrapper Classes, 1D, 2D and Multidimensional Arrays,	2
6	Operators -Arithmetic Operators, Logical Operators, Relational Operators , Bitwise, Boolean Logical, Assignment operator	2
7	Control statements – if, switch Iterations – Loops (while, for, do-while)	1
8	Introduction, creation of classes, object reference variables, methods, constructors, this key word , garbage collection and finalize method()	3
9	Overloading , Inheritance	1
10	Packages, Interface and Exception Handling	2
11	The String Buffer Class Applets, Life cycle of applet	2
	UNIT – III (Assignment – III)	
12	Threads: Creating Threads, Thread Priority, Blocked States, Extending Thread Class, Runnable Interface, Starting Threads, Thread Synchronization, Synchronize Threads, Sync Code Block, Overriding Synced Methods, Thread Communication, wait, notify and notify all.	2
13	AWT Components, Component Class, Container Class, Layout Manager Interface	3
14	Default Layouts, Insets and Dimensions, Border Layout, Flow Layout, Grid Layout, Card Layout Grid Bag Layout AWT Events, Event Models,	3
15	Listeners, Class Listener, Adapters, Action Event Methods Focus Event Key Event, Mouse Events, Window Event	4
16	Tutorial – I	2

UNIT –IV (Assignment -IV)		
17	File – Handling Input/Output Stream, Stream Filters, Buffered Streams, Data input and Output Stream, Print Stream Random Access File,	2
18	JDBC (Database connectivity with MS-Access, Oracle, MS-SQL Server)	1
19	Object serialization, Socket Programming	2
20	Remote Method invocation (RMI) , Java Native interfaces (JNI), Development of a JNI based application.	2
21	Collection API Interfaces, Vector, stack, Hashtable classes, enumerations, set, List, Map, Iterators.	2
22	Tutorial -II	1

Resources Used:

Text Books:

[T1] Patrick Naughton and Herbertz Schidt, ―Java-2 the complete Reference TMH
[T2] Sierra & bates, ―Head First Java, O'Reilly

Reference Books:

[R1] E. Balaguruswamy, ―Programming with Java‖, TMH
[R2] Horstmann, ―Computing Concepts with Java 2 Essentials‖, John Wiley.
[R3] Decker & Hershfield, ―Programming.Java, Vikas Publication

	LECTURE PLAN- ANALOG ELECTRONICS-I	ECC-211
		TOTAL: 40
S.NO	**TOPIC**	**DURATION (In Hr.)**
	UNIT-I	**10**
1	Forward and reverse biased diode, I-V characteristics of diode, Diode Equation,	3
2	Temperature dependence of diode. Breakdown phenomena, diffusion and transition capacitance of diode	2
3	Diode equivalent circuit, Ideal diode. Solar cell.	1
4	Diode circuits: half-wave, Full-wave rectifiers with capacitor filter	2
5	Clamping and clipping circuits Zener diodes as voltage regulator.	2
	UNIT-II	**10**
6	Bipolar Junction transistor (BJT): Structure, modes of operation	1
7	BJT Configurations, I-V characteristics, early effect, junction voltages	1
8	Transistor Biasing: Need of biasing, load line concept, fixed bias, self-bias, collector to base bias, stability factors,	3
9	Current Mirrors; hybrid model of BJT amplifier, small signal analysis of CE BJT amplifier using h parameter	2
10	JFET: Physical structure, I-V characteristics	1
11	MOSFET: Depletion and enhancement types, Physical structure and I-V characteristics	1
12	FET small-signal model (low & high frequency); MOSFET as resistance and switch,	1
	UNIT-III	**10**
13	Cascade amplifiers: Analysis of cascade amplifier (voltage gain, current gain, input and output impedances);	2
14	Darlington pair, Cascode amplifier; Types of coupling: DC, RC and Transformer;	1
15	RC coupled Amplifier and its frequency response;	1
16	Differential Amplifier: differential and Common mode operation, CMRR.	1
17	Power Amplifiers: Classification of output stages (Class A, B, C & AB)	1
18	Class A Amplifier, Transformer coupled class A amplifier, Push pull amplifiers:	2
19	Class A and Class B, Harmonic distortion, efficiency, crossover distortion, class AB operation, Class C amplifier.	2
	UNIT-IV	**10**
20	Feedback Amplifiers: classification, Feedback concept,	2
21	Basic feedback topologies, Characteristics of Negative Feedback, Feedback and stability, gain margin, Noise margin,	2
22	Impedance considerations in different configurations.	2
23	Sinusoidal Oscillator, Barkhausen criterion, RC phase shift, LC (Colpitt's, Hartley, Clapp),	3
24	Crystal Oscillator.	1

TEXT BOOKS

1. J. Millman, C.C. Halkias and Satyabrata Jit, "Electronic Devices and Circuits", Tata McGraw Hill, 4th ed. , 1998
2. R. L. Boylestad and N. Nashlesky, "Electronic Devices and Circuit Theory", Pearson Education, 11th Ed., 2014

Reference Books:

1. Adel S. Sedra and Kenneth C. Smith, "Micro Electronic Circuits Theory and Applications," 5th Edition , OUP, 2004.
2. B. Kumar and S. B. Jain, "Electronic Devices and Circuits"", Prentice Hall of India, 2007
3. S Salivahanan, and N. Suresh Kumar, "Electronic Devices and Circuits", McGraw Hill Education (India), 2018
4. B.P. Singh and Rekha Singh, "Electronic Devices and Integrated Circuits", Pearson Education, 2009.
5. J. J. Cathey, "Schaum's Outline of Theory and Problems in Electronic Devices and Circuits", McGraw Hill, 2002.

LECTURE PLAN

Paper Code:ECC-210 **Subject: Microprocessors and Microcontrollers**

Total Duration:32Hr **Faculty: Dr. Usha Sharma**

S.No.	*TOPIC*	*DURATION(in Hr.)*
	UNIT- I	**8**
1	Introduction to Microprocessor Systems	1
2	Architecture and PIN diagram of 8085	1
3	Timing Diagram	2
4	Memory organization	1
5	Addressing modes	1
6	Interrupts	1
7	Assembly Language Programming	1
	UNIT- II	**9**
8	8086 Architecture, difference between 8085 and 8086 architecture	1
9	Generation of physical address, PIN diagram of 8086	1
10	Minimum Mode and Maximum mode, Bus cycle	1
11	Memory Organization, Memory Interfacing	1
12	Addressing Modes, Assembler Directives	2
13	Instruction set of 8086, Assembly Language Programming	2
14	Hardware and Software Interrupts	1
	UNIT- III	**8**
15	Generation of I/O Ports, Programmable Peripheral Interface (PPI)-Intel 8255	3
16	Sample-and-Hold Circuit and Multiplexer, Keyboard and Display Interface, Keyboard and Display Controller (8279)	1
17	Programmable Interval timers (Intel 8253/8254)	1
18	USART (8251), PIC (8259)	1
19	DAC, ADC, LCD, Stepper motor	2
	UNIT- IV	**7**
20	Introduction to 8051 Micro-controller, Architecture	1
21	Memory organization, Special function registers	1
22	Port Operation, Memory Interfacing, I/O Interfacing	1
23	Programming 8051 resources, interrupts	1
24	Data transfer instructions, Arithmetic instructions, Logic instructions, Control transfer instructions	1
25	Timer & Counter Programming, Interrupt Programming	2

Text Books:
[T1] Muhammad Ali Mazidi, —Microprocessors and Microcontrollers‖, Pearson, 2006 [T2] Douglas V Hall, —Microprocessors and Interfacing, Programming and Hardware‖ Tata McGraw Hill, 2006.
[T3] Ramesh Gaonkar, —MicroProcessor Architecture, Programming and Applications with the 8085‖, PHI
References Books:
[R1] Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. MCKinlay —The 8051 Microcontroller and Embedded Systems‖, 2nd Edition, Pearson Education 2008.
[R2] Kenneth J. Ayala, —The 8086 Microprocessor: Programming & Interfacing The PC‖, Delmar Publishers, 2007.
[R3] A K Ray, K M Bhurchandi, —Advanced Microprocessors and Peripherals‖, Tata McGraw Hill, 2007.
[R4] Vaneet Singh, Gurmeet Singh, —Microprocessor and Interfacing‖, Satya Prakashan, 2007.

UNIVERSITY SCHOOL OF INFORMATION & COMMUNICATION TECHNOLOGY

GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY

Lesson Plan

(for BTech Programmes of Studies under the aegis of USICT offered at Affiliated Institutions of the University)

Paper Code(s): ES101/ES102	**L/T**	**C**
Paper Name: Programming In C	**3**	**3**

S No	TOPICS	Lecture / Tutorial	CO(s)	Text Book
Unit - I				
1	Computer system, components of a computer system, computing environments, computer languages	1	Ability to develop simple algorithms for arithmetic and logical problems and implement them in 'C'. (CO1)	[T1][T2]
2	Algorithms: Representation using flowcharts, pseudocode.	1		[T1][T2]
3	Introduction to C language: History of C, basic structure of C programs.	1		[T2]
4	Creating and running programs, Preprocessor directives, Compilation process, role of linker, idea of invocation and execution of a program. Process of compiling and running a C program, C tokens.	1		[T2]
5	Keywords, identifiers, constants, strings, special symbols, variables, data types, I/O statements. Interconversion of variables, C tokens	1		[T2]
6	Operators and expressions: Operators, arithmetic, relational and logical, assignment operators	1		[T2][T1]
7	Increment and decrement operators, bitwise and conditional operators, special operators	1		[T2]
8	Operator precedence and associativity, evaluation of expressions, type conversions in expressions.	1		[T2]
Unit - II				
9	Control structures: Decision statements; if, If-else and switch statement; Loop control statements:for and Nested for, While and do while loops, Jump statements, break, continue and goto statements.	2	Ability to implement conditional branching, iteration and recursion and functions in 'C' (CO2)	[T1][T2]
10	Arrays: Concepts, One dimensional array, declaration and initialization of one dimensional arrays, Two dimensional arrays, initialization and accessing, Multi dimensional arrays, initialization and accessing	2		[T1][T2]
11	Functions: User defined and built-in Functions, storage classes. Parameter passing in functions, call by value, Passing arrays to functions: idea of call by reference, Recursion.	2		[T1][T2]
12	Strings: Arrays of characters, variable length character strings, Inputting character strings, character library functions, String handling functions	2		[T1][T2]
Unit - III				
13	Pointers: Pointer basics, pointer arithmetic, pointers to pointers.	1	Ability to use arrays, pointers, union and structures to develop	[T2]
14	Generic pointers, array of pointers, functions returning pointers	1		[T2]
15	Dynamic memory allocation. Pointers to functions. Pointers and Strings	1		[T2]

16	Structures and unions: Structure definition, initialization, accessing structures	1	algorithms and programs in 'C' (CO3)	[T2]
17	Nested structures, arrays of structures, structures and functions, self-referential structures	1		[T2]
18	Unions, typedef, enumerations.	1		[T2]
19	File handling: command line arguments, File modes	1		[T2]
20	Basic file operations read, write and append, Scope and life of variables, multi-file programming.	1		[T2]
Unit - IV				
21	C99 extensions. 'C' Standard Libraries: stdio.h, stdlib.h, assert.h, Math.h, time.h, ctype.h, setjmp.h, string.h, stdarg.h, unistd.h	3	Ability to decompose a problem into functions and synthesize a complete program using divide and conquer approach in 'C' (CO4)	[T2]
22	Basic Algorithms: Finding Factorial, Fibonacci series, Recursion(in detail)	2		[T1][T2]
23	Linear and Binary Searching, Basic Sorting Algorithms- Bubble sort, Insertion sort and Selection sort	3		[T1][T2]
24	Find the square root of a number, array order reversal, reversal of a string	2		[T1][T2]

Text Books:

[T1] *How to solve it by Computer* by R. G. Dromey, Prentice-Hall India EEE Series, 1982.

[T2] *The C programming language* by B W Kernighan and D M Ritchie, Pearson Education, 1988.

References:

1. *Programming Logic & Design* by Tony Gaddis, Pearson, 2nd Ed. 2016.
2. *Programming Logic and Design* by Joyce Farrell, Cengage Learning, 2015.
3. *Engineering Problem Solving With C* by Delores M. Etter, Pearson, 2013.
4. *Problem Solving and Program Design in C* by Jeri R. Hanly and Elliot B. Koffman, Pearson, 2016.
5. *Structure and Interpretation of Computer Programs* by Harold Abelson and Gerald Sussman with Julie Sussman, MIT Press, 1985.
6. *How to Design Programs* by Matthias Felleisen, Robert Bruce Findler, Matthew Flatt, and Shriram Krishnamurthi, MIT Press, 2018.
7. *ANSI/ISO 9899-1990, American National Standard for Programming Languages 'C'* by American National Standards Institute, Information Technology Industry Council, 1990 (C89).
8. *ISO/IEC 9899:1999. International Standard for Programming Languages – C (ISO/IEC 9899)* by American National Standards Institute, Information Technology Industry Council, 2000 (C99).
9. *INCITS/ISO/IEC 9899-2011. American National Standard for Programming Languages 'C'* by American National Standards Institute, Information Technology Industry Council, 2012 (C11).

***Note:* References can be utilized as desired.**