

BHAVNAGAR UNIVERSITY
B. E. SEM -IV (IT)

IT-401: DISCRETE MATHEMATICS AND NUMERICAL ANALYSIS.

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
3	-	-	100	3	00	00	100

(A) DISCRETE METHOD:

1. PREDICATE CALCULUS
introduction, objectives, predicates, statement functions, variable and quantifiers, free and bound variables, special valid formulas involving quantifiers - theory of inference for "the predicate calculus.
2. FUZZY SETS:
Some useful definitions, -basic operations on fuzzy sets Image and inverse image, I-V
3. GROUP THEORY
Definition and examples of semi groups, monoids and groups. Abelian group, cyclic group, subgroup, Permutation group, coset decomposition of groups, normal subgroups. Lagrange theorem.
4. LATTICES :
Poset, Lattice as a poset, properties of lattices, Lattices as algebraic system, sublattices, direct product and homomorphism, complete lattices, bounds of lattices, distributive lattices, complemented lattice.
5. BOOLEAN ALGEBRA :
Introduction, definition and properties, sub-Boolean algebra direct product and homomorphism, atoms, Stone's representation theorem, Boolean expressions and their equivalence. min. term and Maxterm. Boolean algebra, values of Boolean expressions, canonical forms, Boolean functions, symmetric Boolean functions.
6. GRAPH THEORY :
Basic concept of graph theory, Basic definitions, Path, reachability and connectedness, Matrix representations of graphs: Trees.

(B) NUMERICAL METHODS:

1. Solution of algebraic & transcendental equations by Bisection, false position, Newton Raphson method.
2. Solution of Linear simultaneous equations, Gauss elimination, Gauss seidel method.
3. Finite difference and interpolation, numerical difference and numerical integration.

REFERENCE BOOKS:

1. TREMBLAY, J.P. & Manohan R. Discrete Mathematical structures with applications to computer science, McGraw Hill, New Delhi.
2. Rosen Kenneth, Discrete Mathematics and its applications, McGraw Hill- New Delhi.
3. Alan Doerr & Kenneth L. Applied Discrete structures for computer science, Gargotia publications Pvt. Ltd. New Delhi.
4. Solan, B & Busby R.C. – Discrete Mathematical structures for computer science, Prentice Hall of India Pvt. Ltd. New Delhi.
5. George J. Klir/Boyan – Fuzzy set and Fuzzy, logic, theory and applications, Prentice Hall of India, N. Delhi.
6. Numerical Methods for Scientist & Engineers By B.S. Grewal.

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IT-402 : INTERNET PROGRAMMING

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
4	-	2	100	3	25	25	150

TOPICS AND SUB-TOPICS

1.0 The Genesis of Java

- 1.1 Stage of Java
- 1.2 Creation & need of java
- 1.3 Importance of Java

2.0 An Overview of java

- 2.1 Object Oriented Programming
- 2.2 A simple program
 - 2.2.1 White space
 - 2.2.2 Identifier
 - 2.2.3 Literals
 - 2.2.4 Comments
 - 2.2.5 Separators

3.0 Data types, Variables & Arrays

- 3.1 Integer, Character
- 3.2 Floating point, Boolean
- 3.3 Variables
 - ♣ Declaring
 - ♣ Dynamic Initialization
- 3.4 Type conversion
- 3.5 Arrays:-One dimensional
- 3.6 Strings

4.0 Operators

- 4.1 Arithmetic
- 4.2 Bit-wise
- 4.3 Relational
- 4.4 Logical
- 4.5 Assignment
- 4.6 Operator precedence
- 4.7 Using parenthesis

5.0 Control Statements

- 5.1 If
- 5.2 Switch
- 5.3 While
- 5.4 Do-while
- 5.5 For
- 5.6 Nested loops
- 5.7 Jump statement
- 5.8 Using parenthesis
- 5.9 Break, continue

6.0 Classes & Methods

- 6.1 Class fundamentals
- 6.2 Reference variable
- 6.3 Instance variable
- 6.4 Parameterized constructors
- 6.5 Overloading methods
- 6.6 Recursion
- 6.7 Access control
- 6.8 String class
- 6.9 Command line argument

- 7.0 Inheritance, Packages, Interfaces**
 - 7.1 Inheritance classes
 - 7.2 Package example: - class path
 - 7.3 Interfaces: - define, apply
- 8.0 Exception Handling**
 - 8.1 Fundamentals
 - 8.2 Exception types
 - 8.3 Try & catch
 - 8.4 Throw & throws
 - 8.5 Baiting exception
- 9.0 Multithreaded Programming**
 - 9.1 Thread model
 - 9.2 Messaging
 - 9.3 Create, extend thread
 - 9.4 Dead lock
 - 9.5 Multithreading
- 10.0 I/O Applets**
 - 10.1 Basics
 - 10.2 Stream
 - 10.3 Byte stream class
 - 10.4 Applet fundaments
 - 10.5 Instance of
 - 10.6 Introduction to the AWT classes

SR.NO.	REFERENCES BOOKS	AUTHOR	PUBLISHER
1.	The complete Reference Java 1.1	Herbert Schildt	TMH
2.	An Introduction to Java Programming	Liaing	PHI

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IT-403 DATA STRUCTURE AND ALGORITHMS

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
4	0	2	100	3	25	25	150

- 1- **BASIC CONCEPT OF DATA REPRESENTATION** : Definition of DATA, Cells, fields, arrays and records, different operation on arrays like insertion, deletion and modification of an item in the array.
- 2- **STACKS & QUEUES** : What is stack? Operation on stack (PUSH & POP), implementation of stack, What is queue? Different operation on queue, implementation of queue, circular queue, priority queues.
- 3- **LINKED LIST** : Pointers and linked allocations linked lists & sequential list, difference between linked and sequential list, Operation on linear lists using single linked & doubly linked storage structures, circular linked list, application of linked lists.
- 4- **SEARCHING & SORTING**: various sorting techniques – selection sort-bubble sort- quick, sort merge sort-binary sort-shell sort-radix, sort-Sequential searching, binary searching, hash tables and methods, hashing function, collision resolution techniques.
- 5- **TREES**: Definition and concepts, binary trees, operation on binary trees, binary tree and tree travel algorithms, operation on binary trees, list representation of tree.
- 6- **STRINGS** : String and their representation, string conversion, string manipulation string arrays, different operation and string like (PUSH & POP) application of different sorting and searching algorithm on strings.

REFERENCES :

- 1- “Data Structures using C and c++” By : Yediyah Lanssam, Mashe j. Augenstan, Aston M.Tanenpaum, PHI
- 2- “Data structures and program design in C” By : Kruse PHI
- 3- “Data structures in C++” By Dell.

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IT-404 COMMUNICATION TECHNIQUES

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOUR S	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
4	0	2	100	3	25	25	150

1. Introduction: Basic concepts, uses of communication, the structure and type of communication systems, communication system and data communication.
2. Communication Channel Characteristics: The communication channel, electronic waves, frequency and wavelength, the electromagnetic spectrum, bandwidth and channel capacity, bandwidth and distance.
3. Modulation: Modulation and demodulation, Fourier analysis, types of modulation, amplitude modulation, frequency modulation, phase modulation, comparison of analog and digital modulation, synchronous and asynchronous modulation.
4. Analog Communication and Multiplexing: Examples, functions within an analog communication system, multiplexing space, division multiplexing, time division multiplexing, combined modulation systems, Demerits of analog communication and multiplexing.
5. Digital Communication: Description of digital systems, advantages of digital systems, sampling theory, analog to digital conversion, encoding of digital signals, multiplexing and modulation of digital signals.
6. Communication Media: The role of the medium, wire cable, air and vacuum, Fiber optics, noise, noise measurements, the effects of bandwidth limitation, common mode voltage.
7. Communication System Requirement: data communication system issues, codes and formats protocol, synchronous and asynchronous systems, data rates, serial and parallel communications, protocol examples, protocol conversion.
8. The RS-232 Interface Standard: Introduction, RS-232 voltage, data bits, RS-232 signals, examples, interconnections, integrated circuit for RS-232, Other communication interfaces, additional interface needs, Multidrop communication, other key EIA standards, the current loop.
9. Other Communication Interfaces: Additional interface needs, multidrop communication, other key EIA standards, the current loop.
10. Telephone systems and Modems: Basic telephone service, dialing telephone lines, private exchanges, the role of modems, some specific modems, specialized modems.

Text Book:

1. Data communications by William L. Schweber, McGraw-hill

Reference Book:

1. Electronic Communication by Roody Coolen.
 2. Data communication by Prakash G. Gupta, PHI.
 3. Data and Computer Communications by William Stallings, PHI.
- * Term work/Practical shall be based on above syllabus.

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IT-405 DIGITAL COMOPUTER ORGANIZATION

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
3	0	2	100	3	25	25	150

1. DIGITAL COMPUTER ARCHITECTURE:

General purpose registers, Program counter, Memory address & data registers, Instruction registers. Control units, arithmetic logic unit. Flags, Program status word. Execution of a single instruction: Fetch & Execute cycles.

2. INSTRUCTION SET:

Conditional and unconditional transfer of control, Addressing modes, stack operations, Subroutines CALL & RETURN mechanisms, Introduction to assembly language programming.

3. CONTROL UNIT:

Sequencing of control signals, Micro programmed & Hardwired control RISC & CISC architectures.

4. FLOATING POINT NUMBER REPRESENTATION AND ITS PROPERTIES:

IEEE Standard, algorithm for the addition of floating point Numbers.

5. MAIN MEMEORY SYSTEMS:

Organization of static and dynamic, Random memory, Read-only, Programmable read only and erasable programmable read-only memories. Memory addressing .

6. MEMORY MANAGEMENT

Criteria—security, relocatability and sharing, Contiguous and non-contiguous allocation. Virtual memory system; working set; demand paging; page replacement strategies. Cache memories. Memory hierarchy.

7. INPUT AND OUTPUT SYSTEMS:

Device selection. Synchronization . Interrupts. Programmed data transfer; direct memory access. I/O channels and I/O processors.

8. T/OUTPUT AND MASS STORAGE DEVICES:

Organization of disk and tape storage systems. Computer terminals and workstations. Computer networks.

REFERENCE BOOKS:

- 1- Hamacher, Vranesic and Zaky
Computer Organization
Mc Graw Hill International Student Edition
 - 2- Williiam Stallings
Computer Organization and Architecture
Maxwell Macmillan International Edition.
 - 3- John P Hayes (MGH)
Computer Architecture and Organization
 - 4- M Morries Mono (PHI)
Computer System Architecture
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IT-406 APPLICATION PACKAGES

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
0	0	4	00	0	25	25	50

- Working with Excel
 1. Introduction to excel worksheets
 2. Formatting and printing
 3. Working with workbooks
 4. Functions and formulas
 5. Working with excel graphics
 6. Working with lists and databases
 7. Analyzing information and solving problems
- Presenting PowerPoint
 1. Creating presentations
 2. Creating and showing slide shows
- Managing Data with Access
 1. Introduction
 2. Creating g custom databases and tables
 3. Finding information
 4. Creating forms, reports, and data access pages
- Microsoft Outlook
 1. Outlook
 2. Managing your schedule
 3. Working with outlook express
- Microsoft Front Page
 1. Designing web pages
 2. Creating and testing
 3. Using different styles
 4. Publishing

TEXT BOOK: MS OFFICE 2000 BY TATA MC GARAW HILL

* Term work/Practical shall be based on above syllabus.