

SEMESTER- I

COURSE: PROBLEM SOLVING TECHNIQUES USING C

CODE:

CREDITS: 04

UNIT I - PROGRAMMING BASICS

Introduction to Programming Concepts: Software, Classification of Software -Modular Programming, Structured Programming, Algorithms, Flowcharts with examples.-Overview: History, Character set, tokens, Identifiers, Keywords, Data types-Variables, Constants, Symbolic Constants, Operators, Hierarchy of Operators-Expressions, Type Conversions and Library Functions.

UNIT II - INPUT AND OUTPUT FUNCTIONS

Managing Input and Output Operation: Formatted and Unformatted I/O Functions-Decision making, branching and looping: Decision Making Statements - if Statement, if-else statement, nesting of if-else statements, else-if ladder, switch statement, operator-Looping - while, do-while, for loop, Nested loop, break, continue, and go to statements.-Functions: Function Definition, prototyping, types of functions, passing arguments to functions- Nested Functions, Recursive functions

UNIT III - ARRAYS & STORAGE CLASSES

Declaring and Initializing, One Dimensional Arrays, Two Dimensional Arrays -Multi-Dimensional Arrays, passing arrays to functions-Strings: Declaring and Initializing strings, Operations on strings, passing strings to functions-Storage Classes - Automatic, External, Static and Register Variables, Structures-Declaring and Initializing, Nested structureArray of Structure, Passing Structures to functions, Unions, typedef, enum, Bit fields

UNIT IV - MEMORY ORGANIZATION WITH FILES

Pointers – Declarations, Pointer arithmetic, Pointers & functions, call by value, Call by reference- Pointers and Arrays, Arrays of Pointers, Pointers and Structures-Meaning of static and dynamic memory allocation, Memory allocation functions-Files - File modes, File functions, and File operations, Text and Binary files-Command Line arguments. Pre-processor directives, Macros – Definition, types of Macros, Creating and implementing user defined header files.

PRACTICAL**CREDITS: 02****Part A.1****Exercises 1 –5**

- 1) Write a Program to find the roots of the given quadratic equation using if-else if statement.
- 2) Write a menu driven program using switch-case to find:
 - (a) Sum of the digits of number
 - (b) Factorial of N.
- 3) Write a program to find $\cos(x)$ using series $\cos(x) = 1 - x^2/2! + x^4/4! - \dots x^n/n!$
- 4) Write a Program to find whether a given number is prime number or not
- 5) Write a program to arrange the given set of numbers in ascending and descending order.

Part A.2**Exercises 6 – 10**

- 6) Write a program to find product of two N x M matrices.
- 7) Write a program to calculate ${}^n C_r = n!/r! * (n-r)!$ using a function.
- 8) Write a program to display Fibonacci series using recursive function.
- 9) Write a program to concatenate two strings using pointers.
- 10) Write a program to copy content of one file to another file.

Part B.1

A **mini project** must be developed by the students based on the applications of the concepts covered during theory.

Part B.2

A **mini project** must be developed by the students based on the applications of the concepts covered during theory.

Référencés:

1. Kernighan, B.W., Ritchie, D. (2015). C Programming Language, India: Pearson.
2. Prinz, P. and Crawford, T., (2015). C in a Nutshell, O'Reilly Publications
3. Perry, G., Miller, D. (2014). C Programming Absolute Beginner's Guide, 3e. Que Publications.
4. Balaguruswamy, E. (2010). Fundamentals of computers. New Delhi: Tata McGraw Hill Education Pvt. Ltd.
5. Gottfried, B., Chhabra, J. (2010). Programming with C (Schaum's Outlines Series).
6. Sudipto Das. (2010). A Complete Guide to Computer Fundamentals. New Delhi: Laxmi Publications
7. Rajaraman, V. (2007). Computer Basics and C Programming. India: PHI Learning Pvt. Ltd.
8. Balaguruswamy, E. (2007). Programming in ANSI C, New Delhi: Tata McGraw Hill Education Pvt. Ltd.
9. Kamthane, A. N. (2002). Programming with ANSI and Turbo C. Singapore: Pearson Education Asia.
10. Rajaraman, V. (1994). Computer Programming in C. India: PHI Learning Pvt. Ltd.

COURSE: RELATIONAL DATABASE MANAGEMENT SYSTEMS

CODE:

CREDITS: 04

UNIT I- INTRODUCTION TO RDBMS

File Systems Organization - Sequential, Pointer, Indexed, Direct. Purpose of Database System- System Terminologies and characteristics. Data models – Types of data models – Components of DBMS- Relational Algebra. Logical Database Design: Relational DBMS - Codd's Rule - Entity-Relationship model. Extended ER Normalization – Functional Dependencies, Anomaly- 1NF to 5NF- Domain Key Normal Form

UNIT II - QUERY AND TRANSACTION PROCESSING

SQL Standards - Data types - Database Objects. DDL-DML-DCL-TCL-Embedded SQL- Static Vs. Dynamic SQL. Query Processing and Optimization - Heuristics and Cost Estimates in Query Optimization. Properties of Transaction- Serializability. Concurrency Control – Locking Mechanisms- Two Phase Commit Protocol-Dead lock – De-normalization

UNIT III - DATABASE TECHNOLOGY

Overview of Physical Storage Media – Magnetic Disks – RAID – Tertiary storage. File Organization – Organization of Records in Files – Indexing and Hashing –Ordered Indices – B+ tree Index Files – B tree Index Files. Static Hashing – Dynamic Hashing. Introduction to Distributed Databases- Client server technology- Multidimensional and Parallel databases- Spatial and multimedia databases- Mobile and web databases. Data Warehouse-Mining- Data marts.

UNIT IV - ADVANCED TOPICS IN DATABASES

Database Security: Data Classification-Threats and risks – Database access Control – Types of Privileges – Cryptography. Statistical Databases. - Distributed Databases-Architecture-Transaction Processing. Data Warehousing and Mining-Classification-Association Rules- Clustering-Information Retrieval- Relevance ranking. Crawling and Indexing the Web. Object Oriented Databases-XML Databases.

PRACTICAL

Credits: 02

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Query Processing and Optimization - Heuristics and Cost Estimates in Query Optimization. Properties of Transaction- Serializability.

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UNIT IV - ADVANCED TOPICS IN DATABASES

Database Security: Data Classification-Threats and risks – Database access Control – Types of Privileges – Cryptography.

References:-

- 1 Database Systems, 6th edition, R Elmasri, Shamkant B.Navathe, Pearson Education.
- 2 Database System Concepts, Peter Rob & Carlos Coronel, Cengage Learning.
- 3 Introduction to Database Management, M. L. Gillenson and others, Wiley Student Edition.

COURSE: INFORMATION SYSTEMS & APPLICATIONS

CODE:

CREDITS: 04

UNIT-I SYSTEMS ENGINEERING

System concepts, system control, types of systems, handling system complexity, Classes of systems, General model of MIS, Need for system analysis, System analysis for existing system & new requirement, system development model, MIS & system analysis

UNIT-II INFORMATION AND KNOWLEDGE

Information concepts, classification of information, methods of data and information collection, value of information, information: A quality product, General model of a human as information processor, Knowledge

UNIT-III INTRODUCTION OF MIS

MIS: Concept, Definition, Role of the MIS, Impact of MIS, MIS and the user, Management as a control system, MIS support to the management, Management effectiveness and MIS, Organization as system. MIS: organization effectiveness

UNIT-IV DECISION MAKING AND DSS

Decision making concepts; decision making process, decision-making by analytical modeling, Behavioral concepts in decision making, organizational decision-making, Decision structure, DSS components, Management reporting alternatives.

DIGITAL ELECTRONICS AND COMPUTER ARCHITECTURE**CODE:****CREDITS: 04****UNIT I - INTRODUCTION TO NETWORK THEOREMS AND AC FUNDAMENTALS**

Ohm's law, Kirchhoff's law: KVL, KCL, Mesh/loop analysis.-Delta/star, star/Delta transformation, Need for application of network theorems. Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer Theorem - Reciprocity theorem: Statement, explanation of theorem by considering a simple resisting network, expression for maximum power deliver ($P_L(\max) = V_{th}^2/4R_{th}$) (no derivation), graph of V_s P_L , numerical problems and applications-Reciprocity theorem, Statement, explanation using resistive network with DC source and numerical problems

UNIT II - SEMICONDUCTOR DEVICES

Introduction, atomic structure, energy level, energy band diagram in solids, classification of conductors, insulators, semiconductor-Semiconductor, properties, crystal structure of semiconductor, types – intrinsic and extrinsic semiconductor-Semiconductor devices : PN junction diode, formation of pn junction layer, potential barrier, energy level diagram of pn junction, Biasing of pn junction, behavior of pn junction under forward and reverse biasing, break down in pn junction, avalanche and zener break down.(K,A,AP)-Diode characteristics; diode parameters, bulk resistance, knee voltage, static and dynamic resistance, PIV-application of diode; As a rectifier, as logic gate, as a switch, etc. Rectifier, types, Half wave Full wave. Half wave rectifier

UNIT III - NUMBER SYSTEMS REPRESENTATION

Number Systems: Introduction to number systems – positional and non-positional, Base /Radix. Decimal number system-Definition, digits, radix/base, Binary number system –Bit Byte, Conversions: Binary to Decimal and Decimal to Binary.-Octal number system-Conversion from Octal to Decimal to Octal, Octal to Binary and binary to Octal. Hexadecimal number system –Conversion: Decimal to Hex, Hex to decimal, Hex to Binary, Binary to Hex, Octal to Hex, Hex to Octal-Binary Arithmetic –addition, subtraction, multiplication and division (Integer part). 1's and 2's compliment, Subtraction.-Binary code: BCD numbers, 8421 code, 2421 code- examples and applications.-Gray code –Conversions-Gray to binary and Binary to Gray, application of gray code (Mention only). Excess-3 code – self complimenting property and applications.

UNIT IV - COMBINATORIAL LOGIC CIRCUITS

Logic Gates: AND Gate: Definition, symbol truth table, timing diagram, Pin diagram IC 7408. OR Gate: Definition, symbol, truth table, timing diagram IC 7432- NOT Gate: Definition symbol, truth table, timing diagram, Pin diagram IC 7404. NAND Gate: Definition, symbol, truth table, Pin diagram IC 7400.-NOR Gate: Definition, symbol, truth table, timing diagram, Pin diagram IC 7402. Exclusive OR Gate: Definition, symbol, truth table, timing diagram Combinational logic circuits: Definition, applications. Half Adder: Symbol, Logic circuits using XOR and basic gates, Truth table.-Full Adder: Symbol, Logic

circuits using XOR and basic gates, Truth table, Half Subtractor: Symbol, Logic circuits using XOR and basic gates, Truth table.

Références:

1. Floyd, T. L., & Floyd, T. L. (2003). Digital fundamentals with VHDL. Upper Saddle River, NJ: Prentice Hall.
2. Mano, M. M., Kime, C. R., & Martin, T. (2016). Logic and computer design fundamentals.
3. Thomas L. Floyd, "Digital Fundamentals", Pearson Education Inc, New Delhi, 2003.
4. Mehta V K and Mehta Shalu: "Principles of Electronics", 7th Edition S. Chand & Company Ltd.
5. Textbook Of Digital Electronics by Shriram K., Vasudevan Jai, Vighneshwar J. Sumana Raviganesan MedTech USA ©2013
6. A Textbook of Digital Electronics Paperback – Import, 30 Nov 2011 by S.S. Bhatti, Rahul Malhotra
7. Morris Mano, "Digital Design", 5th Edition, Prentice Hall, 2013
8. R.P.Jain, "Modern Digital Electronics", 3rd Edition, Tata McGraw Hill, 2003
9. Bignell and Donovan, "Digital Electronics", 5th Edition, Thomson Publication, 2007
10. Theraja B L: "Basic Electronics solid state", 5th Edition. S. Chand & Company Ltd.
11. Bhargava, N N, Kulshreshtha, D C and Gupta, S C: "Basic Electronics and Linear Circuits", 1989, TMH.
12. Floyd, Thomas L: "Digital Computer Fundamentals", 3rd Edition, 1997. University Book Stall.