

2.1 Implementation of Data Structure Using C

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Rationale

Data structures are the techniques of designing the basic algorithms for real-life projects. Understanding of data structures is essential and this facilitates the understanding of the language. The practice and assimilation of data structure techniques is essential for programming. The knowledge of 'C' language and data structures will be reinforced by practical exercises during the course of study. The course will help students to develop the capability of selecting a particular data structure.

DETAILED CONTENTS

Unit –1 **10 Periods**

Revision of C fundamentals. Structures and Unions: Declaration of structures, Accessing structure members, Structure Initialization, Arrays of structure, Unions. Introduction to data structure, Primitive data structure, Non primitive data structure, Linear data structure, Non- Linear datastructure, operation on data structure, Algorithm analysis & complexity

Unit –2 **10 Periods**

Concept of Arrays, Single dimensional array, Two dimensional array storage strategy of multidimensional arrays, Index Formula for single and multidimensional Array, Operations on arrays with Algorithms (Insertion, deletion), Advantages and Disadvantage

Unit –3 **12 Periods**

Stacks, Queues and Recursion:
Introduction to stacks, Representation of stacks, Implementation of stacks using Array & Link List, Uses of stacks, Introduction to queues, Implementation of queues, Circular Queues, De-queues, Recursion.

Unit –4 **12 Periods**

Linked Lists: Introduction to linked list and double linked list, Representation of linked lists in Memory, Traversing a linked list, Searching linked list, Insertion and deletion into linked list, Application of linked lists, Doubly linked lists, Traversing a doubly linked lists, Insertion and deletion into doubly linked lists

Unit –5 **12 Periods**

Trees and Graph Concept of Trees, Concept of representation of Binary tree, Binary search trees Traversing Binary Trees (Pre order, Post order and In order), Introduction to graphs, types of graphs, Breadth first search, Depth first search

Unit –6 **08 Periods**

Sorting and Searching Introduction, Search algorithm (Linear and Binary), Concept of sorting, Sorting algorithms (Bubble Sort, Insertion Sort, Quick Sort, Selection Sort, Merge Sort, Heap Sort, Radix Sort) and their comparisons, Complexity Analysis of Sorting Algorithms.

LIST OF PRACTICALS

1. Inserting and deleting elements in an array
2. Insertion and deletion of elements in linked list
3. Insertion and deletion of elements in double linked list
4. Stack implementation using arrays
5. Stack implementation using pointers
6. Queue implementation using arrays
7. Queue implementation using pointers
8. Linear search in a given list
9. Binary search in a given list
10. Implementation of binary search tree
11. Implementation of bubble sort algorithm
12. Implementation of insertion sort algorithm
13. Implementation of quick sort algorithm
14. Implementation of selection sort algorithm
15. Conversion from infix and post-fix notation
16. Implementation of factorial of a number using recursion
17. Implementation of Fibonacci series using recursions

RECOMMENDED BOOKS

1. Data structures – Schaum’s Outline Series by Lipschutz; McGraw Hill Education P Ltd , New Delhi
2. Data Structures using C and C++ by Rajesh K. Shukla; Wiley-India Pvt Ltd. Daryaganj, New Delhi
3. Data Structures and Algorithm Using C by RS Salaria; Khanna Book Pub. Co. (P) Ltd. New Delhi
4. Data Structure using C by Manoj Kumar Jambla; Eagle Publishing House, Jalandhar
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5. Expert Data Structures with C by R.B. Patel; Khanna Publishers, New Delhi.
6. Data Structure through C by YashwantKanekar; BPB Publications

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	10	10
2	12	10
3	12	20
4	12	15
5	10	15
6	08	10
Total	64	80

2.2 Desktop Publishing

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Rationale

This course enables students to understand various printing technologies and tools including photoshop, Page Maker and CorelDraw.

DETAILED CONTENTS

Unit –1

04 Periods

Introduction to Desktop Publishing (DTP) ,Salient features, applications and advantages

Unit –2

16 Periods

Photoshop-History & introduction, the file menu, the tools, Drawing lines & shapes. Inserting picture and shapes, filling colors, text effects, working with layers, filters, Creating design patterns, Photoshop presentations -static & dynamic presentation, WEB & WEB GALLERY using internet explorer in photo shop. creating animations using image ready, creating animations & presentations . Tips and tricks in Photoshop.

Unit –3

16 Periods

Corel draw –An overview, menus and tools, Drawing –lines, shapes .inserting-pictures, objects, tables, templates, Adding special effects, Exporting drawings, outlining & filling objects, inserting symbols & Clip arts, Working in Corel draw presentation –adjusting the position, resizing, positioning, merging, color shades & shadows .working with advanced effects, special interactive effects. Creating- business cards, pamphlets, banners, news papers, books. Shortcut keys in Corel draw.

Unit –4

16 Periods

Page maker- An introduction, basics menus & tools, Guides & rulers. Drawing tools. Fills & outlines, Working with- text, paragraphs, tabs & indents, graphics, tables. Importing & exporting, story editing & printing. Tips & Shortcut keys , Creating book works-introduction-building booklets, completing the book.

Unit –5

12 Periods

Types of Printing an Introduction-Letterpress printing-lithography-offset printing- different printing process-machines for letterpress, offset, gravure, flexography and screen printing- printing materials, planning a printing, design factors, color application-film assembly and plate making-binding & finishing, Image editing, color correction, color management, poly master, methods of color proofing ,Different types of font, text file formats, vector & raster graphics, graphics file formats. Page setting, character & paragraph formatting, indentation, alignments, hyphenation, single & double sided documentation.

LIST OF PRACTICALS

1. How to make smooth curved lines in Photoshop?
2. Extract an object from a given picture?
3. Create a new picture. Make it 300 pixels high and 400 pixels wide. The resolution should be 72 pixels/inch.
4. How to create your very own animated beating heart in Photoshop?
5. How to make falling objects that will work as seamless backgrounds and have objects falling at different paces in Photoshop?.
6. How to insert a picture in the existing image background?
7. Create a 3D text in Corel Draw
8. Create an advertisement for a Textile company in Corel
9. Design a business card for a company embed photo in it.
10. Design a banner for a marriage function
11. Open Pagemaker and create a new magazine layout which includes the following setup options:
 - page size - magazine narrow
 - orientation tall
 - 4 page spread
 - numbering - Lower Roman
 - margins 1.25 inches- top, and .75 inches - all other sides.
12. Save the document as class example.
13. On the first page of your magazine spread, select the Text tool from the Pagemaker toolbox and draw a text box. In the text box, on nine individual lines type the word "text attribute." Use each of these nine lines to illustrate each of the nine text attributes that you can use from the text palette. You might find Figure 6 on page 92 of the optional Pagemaker book useful. On line ten, type the word "The" with a capital "T." Set the font size for the capital "T" at 24 point. Set the font size for the "he" at 12. Use kerning on your text palette to pull the "h" underneath the capital "T"
14. Use<Print Screen> to capture Pagemaker's floating control palette and paste it into the second page of your magazine layout.. Select the crop tool from the Pagemaker toolbox and crop the pasted image to include only the control palette.
15. Go to page 3 of your magazine layout. Insert a new text box and in the text box list all the file name rules that you should follow when saving files that will be used on the web
16. Go to page 4 of your magazine layout. Insert a new text box. Enter the following text:
 - A title (e.g., AEE 210 Pagemaker Exercise - July 12, 2014)
 - Your name
 - Your address
 - Your email addressPosition the upper left hand corner of the textbox at exactly 2" down and 2"over. Make the text box exactly 4" wide.
17. . Insert vertical guidelines on page 4 at 2", 4" and 6" and insert horizontal guidelines at 2", 4", 6" and 8".
18. Save your work and close Pagemaker.

RECOMMENDED BOOKS

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
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1	04	05
2	16	20
3	16	20
4	16	20
5	12	15
Total	64	80

2.3 Data Base Management System with MS- Access

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Rationale

Database and database systems have become an essential component of everyday life in modern society. This course will acquaint the students with the knowledge of fundamental concepts of DBMS and its application in different areas, storage, manipulation and retrieval of data using query languages.

DETAILED CONTENTS

Unit –1

10 Periods

Traditional file processing system : Characteristics, limitations, Database : Definition, composition.

Database Management System: Definition, Characteristics, advantages over traditional file processing system, User of database, DBA and its responsibilities, Database schema, instance. DBMS architecture, data independence, mapping between different levels.

Database languages: DDL, DML, DCL. Database utilities, Data Models, Keys: Super, candidate, primary, unique, foreign.

Unit –2

10 Periods

Entity relationship model: concepts, mapping cardinalities, entity relationship diagram, weak entity sets, strong entity set, aggregation, generalization, converting ER diagrams to tables. Overview of Network and Hierarchical model.

Relational Data Model: concepts, constraints. Relational algebra: Basic operations, additional operations.

Unit –3

10 Periods

Database Design: Functional dependency, decomposition, problems arising out of bad database design, normalization, multi-valued dependency, Database design process, data base protection, database integrity.

Database concurrency: Definition and problems arising out of concurrency.

Database security: Authentication, authorization, methods of implementing security.

Unit –4

10 Periods

MS-ACCESS: Introduction to MS-ACCESS.

Tables in Database

Create a Table in MS Access -Data Types, Field Properties, Fields: names, types, properties--default values, format, caption, validation rules Data Entry, Add record delete record and edit text, Sort, find/replace, filter/ select, rearrange columns, freeze columns. Edit a Tables- copy, delete, import, modify table structure, find, replace.

Unit –5

10 Periods

Working with Query

Setting up Relationships- Define relationships, add a relationship, set a rule for Referential Integrity, change the join type, delete a relationship, save relationship Queries & Filter - difference between queries and filter, filter using multiple fields AND, OR , advance filter Queries, create Query with one table, find record with select query, find duplicate record with query, find unmatched record with query, run query, save and change query.

Unit –6

14 Periods

Working with Forms

Introduction to Forms Types of Basic Forms: Columnar, Tabular, Datasheet, Main/Subforms, add headers and footers, add fields to form,add text to form use label option button, check box, combo box, list box Forms Wizard, Create Template.

Working with Reports

Introduction to Reports , Types of Basic Reports: Single Column, Tabular Report Groups/Total, single table report,multi table report preview report print report, Creating Reports and Labels, Wizard.

LIST OF PRACTICALS

1. Exercise involving database tables (05 No.)
2. Exercise involving query. (15 No.)
3. Exercises involving Forms.(05 No.)
4. Exercises involving Reports.(05 No.)

RECOMMENDED BOOKS

1. C.J. Date, "An Introduction to Data Base Systems", 3rd Ed., Narosa Publishers, 1997
2. Jeffrey D. Ullman, "Principles of Database Systems", 2nd Ed., Galgotia Pub., 1984.
3. D. Kroenke., "Database Processing", Galgotia Publications, 1987.
4. Henry F. Korth, "Database System Concepts", McGraw Hill. Inc., 1997.
5. Naveen Prakash, "Introduction to Database Management", TMH, 1993.
6. ElmisryNawathy, "Introduction to database System", Pearson Education India.
7. Content Development Group "Working with MS-OFFICE 2013", TMH

8. B.P. Desai, "Database management system" BPB publications, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	10	10
2	10	15
3	10	15
4	10	15
5	10	15
6	14	10
Total	64	80

2.4 Computer Hardware & Peripherals

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Rationale

A computer engineer should be able to interface and maintain key-board, printer, mouse ,monitoretc along with the computer system. The course provides the necessary knowledge and skills regarding working construction and interfacing aspects of peripherals. The students will get to know how various peripherals communicate with central processing unit of the computer system. The student will be able to maintain keyboard, printer, monitors and Power Supplies (CVTs and UPSs) along with computer system. This subject provides the required background of computer installation, maintenance and testing of peripherals with microcomputers.

DETAILED CONTENTS

Unit –1 10 Periods

Video Display :The basic principle of working of video monitors (CRT/TFT/LCD/LED), video display adapters, video modes,Video display EGA/VGA/SVGA/PCI adapters and their architecture

Unit –2 16 Periods

Key Board and Mouse :Types and basic principle of working of wired /wireless key board and wired /optical/wireless mouse, scan codes. Peripheral Devices, Ports and Connectors: Working principle of various input devices such as Scanner, Tablets, touch screen, light pen, digitizers and joystick, Serial, Parallel, PS/2, USB, RJ- 45, BNC]

Unit –3 10 Periods

Disk Drive: Features and working of hard disk drive, floppy disk drive, optical and DVD disk drives and CD writer, Pen Drive, Logical structure of disk and its organization and boot record

Unit –4 16 Periods

Processor, Motherboard and Memory (Features and Working): RAM, ROM and their types, different types of processor, motherboard Printers : Principle and working of Desk Jet, Inkjet, dot matrix and laser printers and plotters

Unit –5

12 Periods

Networks Peripherals (Features and Working): Hub, Switches, Gateway, Router, Bridge, Modem, Patch Panel, I/O Box, Patch Cord, Wireless access point, LAN card (wired/wireless access)

Unit –6

10 Periods

Power Supplies (Working Principle): SMPS, Constant voltage transformers, On Line/Off Line uninterruptible power supplies (UPS)

LIST OF PRACTICALS

- 1) To identify various components and peripheral devices of computer.
- 2) Demonstration of different Peripherals of a computer system.
- 3) To study the operation of SMPS
- 4) To study the operation of CVT.
- 5) To study the operation of UPS.
- 6) To study the Video display Unit
- 7) To study the Network Connections

RECOMMENDED BOOKS

1. B. Govinda Rajalu, IBM PC and Clones. Hardware Trouble Shooting and Maintenance, Tata McGraw Hill 1991
2. Robert, S Lai: The waite group writing MS DOS Device, Drives, Addison, Wesley Publishing Co. 2nd Ed. 1992.
3. SK Bose “Hardware and Software of Personal Computers” Wiley Eastern Limited, New Delhi.
4. Hall, Douglas “Microprocessors and Interfacing” McGraw Hill
5. Uffenbeck, Microprocessors and Interfacing
6. Sukhvir Singh, Fundamental of Computers, Khanna Publishers, New Delhi
7. Levis Hahenstau, Computer Peripherals for Micro Computers, Microprocessor and PC
8. Peter Norton, Inside the PC (Eight Edition), Tech media

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	10	10
2	16	15
3	10	15
4	16	15
5	12	15
6	10	10
Total	64	80

2.5 Software Engineering

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Rationale

This subject will enable the diploma students to have awareness about software engineering, various matrices, planning about software, cost estimation, software design etc.

DETAILED CONTENTS

Unit –1

20 Periods

The system concepts, characteristics of a system, organization, interaction, inter dependence, integration, control objectives ,Introduction system development life cycle (SLDC), Phases of SDLC, identification, Preliminary investigation/study, facts gathering and its techniques(Interviews, questionnaires, Background reading, onsite observation, record gathering etc), types of feasibility- operational, technical, economical, System analysis, System design (Data flow diagram, data dictionary) ,testing, implementation

Unit –2

16 Periods

Introduction to Software Engineering , size factors. Quality and productivity factors. Management issues, Models: waterfall, spiral, prototyping, fourth generation techniques, software process, Introduction to agile technologies

Unit –3

12 Periods

Software Metrics Engineering: Size, function and design oriented metrics, halstead software science, McCabe's complexity Planning : The development process, an organizational structure, other planning activities

Unit –4

16 Periods

Software Cost Estimations: Cost factors, cost estimations techniques. Staffing level estimation, estimating software maintenance costs, COCOMO

Unit –5

16 Periods

Software Requirements Definition: Problem analysis, requirement engineering. The software requirements specifications (SRS), formal specifications techniques, characteristics of a good SRS

Unit –6

16 Periods

Software Design and Implementation Issue: Fundamental design, concept design notations, design techniques, structured coding techniques coding styles, documentation guidelines

RECOMMENDED BOOKS

1. Software Engineering by Rajib Mall, PHI Publishers, New Delhi
2. An Integrated Approach to Software Engineering by Pankaj Jalote, Narosa Publishing House Pvt Ltd, Darya Ganj, New Delhi 110002
3. Software Engineering, SangeetaSabharwal, New Age International, Delhi
4. Software Engineering by KK Aggarwal and Yogesh Singh
5. Software Engineering – A Practitioner's Approach by RS Pressman, Tata McGraw Hill Publishers, New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	20	20
2	16	15
3	12	10
4	16	15
5	16	10
6	16	10
Total	96	80

