

2.1 IMPLEMENTATION OF DATA STRUCTURE USING C

L T P
4 - 5

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 data structure, 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 disadvantages of Arrays, Recursion .

Unit –3 12 Periods

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.

Unit –4 12 Periods

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

Concept of Trees, Concept and 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 using C and C++ by Rajesh K. Shukla; Wiley-India Pvt Ltd. Daryaganj, New Delhi
2. Data Structures and Algorithm Using C by RS Salaria; Khanna Book Pub. Co. (P) Ltd. New Delhi
3. Data Structure using C by Manoj Kumar Jambla; Eagle Publishing House, Jalandhar
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4. Expert Data Structures with C by R.B. Patel; Khanna Publishers, New Delhi.
5. Data Structure through C by Yashwant Kanekar; BPB Publications
6. Data Structure through C by G.S. Baluja

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	10	12
2	10	12
3	12	16
4	12	15
5	12	15
6	08	10
Total	64	80

2.2 DESK TOP PUBLISHING

L T P

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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(working on multiple pages) 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

1. Adobe Photoshop BPB Publication.
2. Corel Draw X7 The Official Guide by Gary David Bouton.
3. Learning Adobe Page Maker by Greg Bowden.

SUGGESTED DISTRIBUTION OF MARKS

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

2.3 DATABASE MANAGEMENT SYSTEM WITH SQL

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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. Oracle/MySQL/SQL Server can be use as package to explain concepts.

DETAILED CONTENTS

Unit-1. Introduction

12 Period

Database Systems; Database and its purpose, Characteristics of the database approach, Advantages and disadvantages of database systems. Classification of DBMS Users; Actors on the scene, Database Administrators, Database Designers, End Users, System Analysts and Application Programmers, Workers behind the scene (DBMS system designers and implementers, tool developers, operator and maintenance personnel).

Unit-2. Database System Concepts and Architecture

12 Period

Data models, schemas, instances, data base state. DBMS Architecture; The External level, The conceptual level, The internal level, Mappings. Data Independence; Logical data Independence, Physical data Independence. Database Languages and Interfaces; DBMS Language, DBMS Interfaces. Classification of Database Management Systems.

Unit-3. Data Modeling using E.R. Model (Entity Relationship Model)

10 Period

Data Models Classification; File based or primitive models, traditional data models, semantic data models. Entities and Attributes, Entity types and Entity sets, Key attribute and domain of attributes, Relationship among entities.

Unit-4. Relational Model:

8 Period

Relational Model Concepts: Domain, Attributes, Tuples and Relations. Relational constraints and relational database schemes; Domain constraints, Key constraints and constraints on Null. Relational databases and relational database schemes, Entity integrity, referential integrity and foreign key.

Unit-5. Normalization

8 Period

Concept of Normalization, Need of Normalization, Non-loss decomposition and functional dependencies, First, Second and Third normal forms, Boyce Codd normal form.

Unit-6.- SQL

14 Periods

SQL's basic objects, data types, aggregate functions, scalar functions, null values, creating database objects, modifying database objects, removing database objects. Creating Tables, Creating a table with data from another table, Dropping a Table, Inserting values into a table, updating columns of a table, Deleting Rows, Database Security and Privileges, Grant and Revoke Command, Maintaining Database Objects, Commit and Rollback, various types of select commands, various types of join.

LIST OF PRACTICALS

1. Creating, modifying and removing database objects.
2. Working with queries involving joins, correlation, sub-queries, set operators.
3. Creating and using stored procedures and user defined functions.
4. Creating indexes
5. Creating and using views.
6. Using and understanding grant, revoke and deny statements.

RECOMMENDED BOOKS

1. Data Base Management System By Ivan Byross
2. C.J. Date, "An Introduction to Data Base Systems", 3rd Ed., Narosa Publishers, 1997
3. Jeffrey D. Ullman, "Principles of Database Systems", 2nd Ed., Galgotia Pub., 1984.
4. D. Kroenke., "Database Processing", Galgotia Publications, 1987.
5. Henry F. Korth, "Database System Concepts", McGraw Hill. Inc., 1997.
6. Naveen Prakash, "Introduction to Database Management", TMH, 1993.
7. Elmisy Nawathy, "Introduction to database System", Pearson Education India.
8. Beginning Microsoft SQL Server 2008 Programming by Robert Vieira, Wrox.
9. Microsoft SQL Server 2008 Bible by Paul Nielsen, Uttam Parui; Wiley India Publication.

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	12	10
2	12	15
3	10	15
4	8	10
5	8	10
6	14	20
Total	64	80

3.4 MULTIMEDIA SYSTEMS

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Rationale

Multimedia is a new concept emerged in the recent times. This technology is currently being widely used in web pages, motion pictures and interactive presentations, animation etc. Multimedia has made a significant impact in training/education, business presentations, public information access etc. This course intends to introduce and expose multimedia technology and various factors and features of authoring software. It will also help in making the internet application richer in content and presentation.

DETAILED CONTENTS

Unit –1	15 Periods
Introduction to Multimedia, Multimedia Information, Multimedia Objects, Multimedia in business and work. Convergence of Computer, Communication and Entertainment products, Stages of Multimedia Projects, Multimedia hardware, Memory & storage devices, Communication devices, Multimedia softwares, presentation tools, tools for object generations, video, sound, image capturing, authoring tools, card and page based authoring tools.	
Unit –2	13 Periods
Multimedia Building Blocks: Text, Sound MIDI, Digital Audio, audio file formats, MIDI under windows environment Audio& Video Capture.	
Unit –3	13 Periods
Data Compression Huffman Coding, Shannon Fano Algorithm, Huffman Algorithms, Adaptive Coding, LZ77, LZW compression, Compression, Compression ratio lossless & lossy compression.	
Unit –4	12 Periods
Speech Compression & Synthesis: Digital Audio concepts, Sampling Variables, Loss less compression of sound, loss compression& silence compression.	
Unit –5	13 Periods
Images: Multiple monitors, bitmaps, Vector drawing, lossy graphic compression, image file formats, animations, Images standards.	

Unit –6

14 Periods

Video: Video representation, Colors, Video file formats, Compression, MPEG standards, MHEG Standard Video Streaming on net, Video Conferencing, Multimedia Broadcast Services, Indexing and retrieval of Video Database, recent development in Multimedia.

RECOMMENDED BOOKS

1. Tay Vaughan, "Multimedia, Making IT Work", McGraw Hill.
2. Buford, "Multimedia Systems", Addison Wesley.
3. Mark Nelson, "Data Compression Hand Book", BPB.
4. Sleinreitz, "Multimedia System", Addison Wesley.

SUGGESTED DISTRIBUTION OF MARKS

SUGGESTED DISTRIBUTION OF MARKS Unit No.	Time Allotted (Hrs)	Marks Allotted
1	15	20
2	13	15
3	13	15
4	12	10
5	13	10
6	14	10
Total	80	80

2.5 OBJECT ORIENTED CONCEPTS USING C++

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5 - 3

Rationale

Object orientation is a new approach to understand the complexities of the real world. In contrast to the earlier approaches like procedural etc, object orientation helps to formulate the problems in a better way giving high reliability, adaptability and extensibility to the applications. The students are already familiar with this concept of programming in C which is the basic for C++. This course offers the modern programming language C++ that shall help the students to implement the various concept of object orientation practically. The students will be able to programme in the object oriented technology with the usage of C++.

DETAILED CONTENTS

1. Introduction

(06 Period)

Algorithm, Flow charts, Testing & Debugging

2. Language Constructs

(18 Period)

Introduction C++ : variables, types and type declarations, user defined data types; increment and decrement operators, relational and logical operators; if then else clause; conditional expressions, input and output statement, loops, switch case, arrays, structure, unions, functions, pointers; preprocessor directives

3. Introduction OOP

(06 Period)

Fundamentals of object oriented programming – procedure oriented programming Vs. object oriented programming (OOP). Object oriented programming concepts – Classes, reusability, encapsulation, inheritance, polymorphism, dynamic binding, message passing, data hiding

4. Classes and Objects

(10 Period)

Creation, accessing class members, Private Vs Public, Constructor and Destructor Objects

5. Member Functions

(06 Period)

Method definition, Inline functions implementation, Constant member functions, Friend Functions and Friend Classes, Static functions

6. Overloading Member Functions

(06 Period)

Need of operator overloading, operator overloading, instream / ostream operator overloading, function overloading, constructor overloading

7. Inheritance

(16 Period)

Definition of inheritance, protected data, private data, public data, inheriting constructors and destructors, constructor for virtual base classes, constructors and destructors of derived classes, and virtual functions, size of a derived class, order

SUGGESTION

of invocation, types of inheritance, single inheritance, hierarchical inheritance, multiple inheritance, hybrid inheritance, multilevel inheritance

8. Polymorphism and Virtual Functions (06 Period)

Importance of virtual function, function call binding, virtual functions, implementing late binding, need for virtual functions, abstract base classes and pure virtual functions, virtual destructors

9. File and Streams (06 Period)

Components of a file, different operation of the file, communication in files, creation of file streams, stream classes, header files, updating of file, opening and closing a file, file pointers and their manipulations, functions manipulation of file pointers, detecting end-of-file.

LIST OF PRACTICALS

- 1 Programming exercises on control flow statements in C++
- 2 Programming exercises on arrays, strings, function and pointers in C++
- 3 Writing programs to construct classes and deriving objects
- 4 Writing programs for constructors, destructors, using public and private access specifies
- 5 Programming exercises on operator overloading, type conversions and inheritance
- 6 Programming exercises on functional overloading
- 7 Writing programs on stream computation.
- 8 Implementation of a mini project in C++
- 9 Introduction to latest ANSI C++ Compiler and elaboration of short comings of Turbo C++ Compiler

LIST OF RECOMMENDED BOOKS

- 1) Mastering C++ by K.R Venugopal and Rajkumar, T Ravishankar; Tata McGraw Hill Education Pvt Ltd , New Delhi
- 2) Object Oriented Programming in C++, W/CD by Rajesh K. Shukla, Wiley-India Pvt Ltd. Daryaganj, New Delhi
- 3) Object Oriented Programming in C++ by E. Balaguruswamy, Tata McGraw Hill Education Pvt Ltd , New Delhi
- 4) C++ by Robert Lafore, Galgotia Publications Pvt. Ltd., Daryaganj, New Delhi
- 5) Object Oriented Programming and C++ by R Rajaram; New Age International (P) Ltd., Publishers, New Delhi
- 6) Schaum's Outline of Programming with C++ by John R. Hubbard

- 7) Object Oriented Programming using C++ by Vipin Arora, Eagle Publication, Jalandhar
- 8) Object Oriented Programming using C++ by RS Salaria
- 9) Object Oriented Programming by D Ravi Chandran Tata McGraw Hill

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Period)	Marks Allotted (%)
1	6	08
2	18	15
3	6	06
4	10	08
5	6	06
6	6	06
7	16	15
8	6	6
9	6	10
Total	80	80

2.6 SOFTWARE ENGINEERING

L T P
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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

15 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

14 Periods

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

Unit -3

10 periods

Software Metrics Engineering: Size, function and design oriented metrics, Halstead software science, Planning : The development process, an organizational structure, other planning activities

Unit-4

12 Periods

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

Unit-5

14 Periods

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

Unit-6

15 Periods

Software Design and Implementation Issue: Fundamental design concept, design notations, design techniques, structured coding techniques, coding styles, documentation guidelines. Software Quality Assurance. Risk Management.

Unit –7

16 Periods

Software Testing: Introduction of software testing, Importance of software testing and standardization, Testing process, Design of test cases, Functional Testing: Boundary value analysis, Equivalence class testing, Decision table testing, Cause effect graphing, Structural

testing, Path testing, Data flow and mutation testing, Unit testing, Integration and system testing, Debugging, Alpha & beta testing, testing tools & standards.

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	Marks
1	15	13
2	14	15
3	10	10
4	12	10
5	14	10
6	15	10
7	16	12
Total	96	80