Ref No:

Sri Krishna Institute of Technology,
Bangalore

COURSE PLAN

Academic Year 2019-2020

Program:	ISE
Semester :	6
Course Code:	17IS62
Course Title:	File Structures
Credit / L-T-P:	04/4-0-0
Total Contact Hours:	50
Course Plan Author:	Tejashwini N

Academic Evaluation and Monitoring Cell

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A. COURSE INFORMATION

1. Course Overview

Degree:	BE	Program:	IS
Semester:	6	Academic Year:	2019-2020
Course Title:	File Structures	Course Code:	17IS62
Credit / L-T-P:	04/4-0-0	SEE Duration:	180 minutes
Total Contact Hours:	50	SEE Marks:	60 marks
CIA Marks:	40	Assignment	1\Module
Course Plan Author:	Tejashwini N	Sign ..	Dt:
Checked By:		Sign ..	Dt:
CO Targets	CIA Target :	SEE Target:	

Note: Define CIA and SEE % targets based on previous performance.

2. Course Content

Content / Syllabus of the course as prescribed by University or designed by institute.

Module	Content	Teaching Hours	Blooms Learning Levels
1	**Introduction:** File Structures: The Heart of the file structure Design, A Short History of File Structure Design, A Conceptual Toolkit; Fundamental File Operations: Physical Files and Logical Files, Opening Files, Closing Files, Reading and Writing, Seeking, Special Characters, The Unix Directory Structure, Physical devices and Logical Files, File-related Header Files, UNIX file System Commands; Secondary Storage and System Software: Disks, Magnetic Tape, Disk versus Tape; CD-ROM: Introduction, Physical Organization, Strengths and Weaknesses; Storage as Hierarchy, A journey of a Byte, Buffer Management, Input /Output in UNIX **Fundamental File Structure Concepts, Managing Files of Records :** Field and Record Organization, Using Classes to Manipulate Buffers, Using Inheritance for Record Buffer Classes, Managing Fixed Length, Fixed Field Buffers, An Object-Oriented Class for Record Files, Record Access, More about Record Structures, Encapsulating Record Operations in a Single Class, File Access and File Organization.	10	L2,L4
2	**Organization of Files for Performance, Indexing:** Data Compression, Reclaiming Space in files, Internal Sorting and Binary Searching, Key sorting; What is an Index? A Simple Index for Entry-Sequenced File, Using Template Classes in C++ for Object I/O, Object-Oriented support for Indexed, Entry-Sequenced Files of Data Objects, Indexes that are too large to hold in Memory, Indexing to provide access by Multiple keys, Retrieval Using Combinations of Secondary Keys, Improving the Secondary Index structure: Inverted Lists, Selective indexes, Binding.	10	L4, L3
3	**Consequential Processing and the Sorting of Large Files:** A Model for Implementing Cosequential Processes, Application of the Model to a General Ledger Program, Extension of the Model to include Mutiway Merging, A Second Look at Sorting in Memory, Merging as a Way of Sorting Large Files on Disk. **Multi-Level Indexing and B-Trees:** The invention of B-Tree, Statement of the problem, Indexing with Binary Search Trees;	10	L3 ,L4

	Multi-Level Indexing, B-Trees, Example of Creating a B-Tree, An Object-Oriented Representation of B-Trees, B-Tree Methods; Nomenclature, Formal Definition of B-Tree Properties, Worst case Search Depth, Deletion, Merging and Redistribution, Redistribution during insertion; B* Trees, Buffering of pages; Virtual B-Trees; Variable-length Records and keys		
4	**Indexed Sequential File Access and Prefix B + Trees:** Indexed Sequential Access, Maintaining a Sequence Set, Adding a Simple Index to the Sequence Set, The Content of the Index: Separators Instead of Keys, The Simple Prefix B+ Tree and its maintenance, Index Set Block Size, Internal Structure of Index Set Blocks: A Variable-order B- Tree, Loading a Simple Prefix B+ Trees, B-Trees, B+ Trees and Simple Prefix B+ Trees in Perspective.	10	L5
5	**Hashing:** Introduction, A Simple Hashing Algorithm, Hashing Functions and Record Distribution, How much Extra Memory should be used?, Collision resolution by progressive overflow, Buckets, Making deletions, Other collision resolution techniques, Patterns of record access. **Extendible Hashing:** How Extendible Hashing Works, Implementation, Deletion, Extendible Hashing Performance, Alternative Approaches.	10	L4,L6
-	**Total**	**50**	

3. Course Material

Books & other material as recommended by university (A, B) and additional resources used by course teacher (C).

1. Understanding: Concept simulation / video ; one per concept ; to understand the concepts ; 15 – 30 minutes
2. Design: Simulation and design tools used – software tools used ; Free / open source
3. Research: Recent developments on the concepts – publications in journals; conferences etc.

Modules	Details	Chapters in book	Availability
A	**Text books (Title, Authors, Edition, Publisher, Year.)**	**-**	**-**
	Michael J. Folk, Bill Zoellick, Greg Riccardi: File Structures-An Object Oriented Approach with C++, 3rd Edition, Pearson Education, 1998		In Lib
B	**Reference books (Title, Authors, Edition, Publisher, Year.)**	**-**	**-**
1	K.R. Venugopal, K.G. Srinivas, P.M. Krishnaraj: File Structures Using C++, Tata McGraw-Hill, 2008.		In Lib
2	Scot Robert Ladd: C++ Components and Algorithms, BPB Publications, 1993.		In Lib
3	Raghu Ramakrishan and Johannes Gehrke: Database Management Systems, 3rd Edition, McGraw Hill, 2003.		In Lib
C	**Concept Videos or Simulation for Understanding**	**-**	**-**
C1			
C2			
C3			
C4			
C5			
D	**Software Tools for Design**	**-**	**-**
1	Turbo c		In lab
E	**Recent Developments for Research**	**-**	**-**

F	**Others (Web, Video, Simulation, Notes etc.)**	**-**	**-**
1			

4. Course Prerequisites

Refer to GL01. If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.
Students must have learnt the following Courses / Topics with described Content . . .

Modules	Course Code	Course Name	Topic / Description	Sem	Remarks	Blooms Level
1	15CS45	Object Oriented Concepts	A Review of structures, Procedure–Oriented Programming system, Object Oriented Programming System, Console I/O,variables and reference variables, Function Prototyping, Function Overloading. Class and Objects Introduction, member functions and data, objects and functions, objects and arrays,	4		L3

5. Content for Placement, Profession, HE and GATE

The content is not included in this course, but required to meet industry & profession requirements and help students for Placement, GATE, Higher Education, Entrepreneurship, etc. Identifying Area / Content requires experts consultation in the area.
Topics included are like, a. Advanced Topics, b. Recent Developments, c. Certificate Courses, d. Course Projects, e. New Software Tools, f. GATE Topics, g. NPTEL Videos, h. Swayam videos etc.

Modules	Topic / Description	Area	Remarks	Blooms Level

B. OBE PARAMETERS

1. Course Outcomes

Expected learning outcomes of the course, which will be mapped to POs.

Modules	Course Code.#	Course Outcome **At the end of the course, student should be able to . . .**	Teach. Hours	Instr Method	Assessment Method	Blooms' Level
1	15CS564.1	Understanding the System Architecture	5	Lecture, discussion	Assignment	L2
2	15CS564.2	Analyze Buffer Management for writing the contents in the file	5	Lecture / PPT,	Assignment, seminar	L4
3	15CS564.3	Compare the Access Management technique in primary memory with time complexity	5	Lecture / PPT, problem solving	Assignment, seminar	L4
4	15CS564.4	Demonstrate the Indexed based access in accessing the files.	5	Lecture, discussion	Question and answer, test	L3
5	15CS564.5	Demonstrate the Parallel accessing	5	Discussion,	Presentati	L3

		of files.		lecture, ppt	on, assignment	
-	15CS564.6	Compare Accessing from Secondary storage and Primary Storage	5	Lecture, discussion	Assignment, viva	L4
	15CS564.7	Evaluate the time taken from secondary storage.	5	Lecture, discussion	Assignment	L5
	15CS564.8	Select the best technique for storing files in Random Storage format	5	Discussion, lecture , PPT	Seminar and assignment	L4
	15CS564.9	Design a technique for collision resolution in Random Storage access	5	Discussion, lecture , PPT	Use case with Seminar and assignment	L6
			45			

2. Course Applications

Write 1 or 2 applications per CO.
Students should be able to employ / apply the course learnings to . . .

Modules	Application Area Compiled from Module Applications.	CO	Level
1	-	15CS564.1	
2	Batch Processing Application	15CS564.2	L4
3	Word processing Application	15CS564.3	L4
4	Search Engine	15CS564.4	L3
5	Batch Processing Application	15CS564.5	L3
6	Data Base (MYSQL) application	15CS564.6	L4
7	Data Base (MYSQL) application	15CS564.7	L5
8	Password verification	15CS564.8	L4
9	Compiler Application	15CS564.9	L6

3. Articulation Matrix

CO – PO Mapping with mapping level for each CO-PO pair, with course average attainment.

-	-	Course Outcomes	Program Outcomes															-
Modules	CO.#	**At the end of the course student should be able to . . .**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	Level
1	15CS564.1	Understanding the System Architecture	3				√											
2	15CS564.2	Analyze Buffer Management for writing the contents in the file	3	√			√											
3	15CS564.3	Compare the Access Management technique in primary memory with time complexity	3	√			√											

4	15CS564.4	Demonstrate the Indexed based access in accessing the files.	3	√	√	√	√			√	√	√						
5	15CS564.5	Demonstrate the Parallel accessing of files.	3	√			√											
6	15CS564.6	Compare Accessing from Secondary storage and Primary Storage	3	√	√		√											
7	15CS564.7	Evaluate the time taken from secondary storage.	3	√	√		√											
8	15CS564.8	Select the best technique for storing files in Random Storage format	3	√	√	√	√				√							
9	15CS564.9	Design a technique for collision resolution in Random Storage access	3	√	√	√	√			√	√	√						
-	**17IS62.**	Average																**-**
-	*PO, PSO*	*1.Engineering Knowledge; 2.Problem Analysis; 3.Design / Development of Solutions; 4.Conduct Investigations of Complex Problems; 5.Modern Tool Usage; 6.The Engineer and Society; 7.Environment and Sustainability; 8.Ethics; 9.Individual and Teamwork; 10.Communication; 11.Project Management and Finance; 12.Life-long Learning; S1.Software Engineering; S2.Data Base Management; S3.Web Design*																

4. Curricular Gap and Content

Topics & contents not covered (from A.4), but essential for the course to address POs and PSOs.

Modules	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1	15CS45 / Object Oriented Concepts	Seminar	2nd week / date	Dr XYZ, Inst	List from B4 above
2		Seminar	3rd Week		

C. COURSE ASSESSMENT

1. Course Coverage

Assessment of learning outcomes for Internal and end semester evaluation.

Modules	Title	Teach. Hours	No. of question in Exam						CO	Levels
			CIA-1	CIA-2	CIA-3	Asg	Extra Asg	SEE		
1	Introduction	10	2	-	-	1	1	2	CO1 , CO2	L2,L4,
2	Organization of Files for Performance, Indexing	10	2	-	-	1	1	2	CO3, CO4	L4,L3
3	Consequential Processing and the Sorting of Large Files	10	-	2	-	1	1	2	CO5, CO6	L4,L3,
4	Indexed Sequential File Access and Prefix B + Trees	10	-	2	2	1	1	2	C07	L5
5	Hashing	10	-	-	2	1	1	2	CO8, C09	L4,L6
-	**Total**	**50**	**4**	**4**	**4**	**5**	**5**	**10**	**-**	

2. Continuous Internal Assessment (CIA)

Assessment of learning outcomes for Internal exams. Blooms Level in last column shall match with A.2.

Modules	Evaluation	Weightage in Marks	CO	Levels
1, 2	CIA Exam – 1	30	CO1 , CO2 , CO3, CO4	L2,L4,L4,L3
3, 4	CIA Exam – 2	30	CO5,CO6,C07	L4,L3,L5

5	CIA Exam – 3	30	C07,CO8,C09	L5,L4,L6
1, 2	Assignment - 1	05	CO1 , CO2 , CO3, CO4	L2,L4,L4,L3
3, 4	Assignment - 2	05	CO5,CO6,C07	L4,L3,L5
5	Assignment - 3	05	C07,CO8,C09	L5,L4,L6
1, 2	Seminar - 1	05	CO1 , CO2 , CO3, CO4	L2,L4,L4,L3
3, 4	Seminar - 2	05	CO5,CO6,C07	L4,L3,L5
5	Seminar - 3	05	C07,CO8,C09	L5,L4,L6
1, 2	Quiz - 1		-	-
3, 4	Quiz - 2		-	-
5	Quiz - 3		-	-
1 - 5	Other Activities – Mini Project	-		
	Final CIA Marks		**-**	**-**

D1. TEACHING PLAN - 1

Module - 1

Title:		Appr Time:	10 Hrs
a	***Course Outcomes***	**CO**	**Blooms**
1	Understanding the System Architecture	CO1	L2
2	Analyze Buffer Management for writing the contents in the file	CO2	L4
b	***Course Schedule***	-	-
Class No	**Portion covered per hour**	**-**	**-**
1	File Structures: The Heart of the file structure Design, A Short History of File Structure Design, A Conceptual Toolkit;		
2	Fundamental File Operations: Physical Files and Logical Files, Opening Files, Closing Files, Reading and Writing, Seeking,		
3	Special Characters, The Unix Directory Structure, Physical devices and Logical Files, File-related Header Files,		
4	UNIX file System Commands; Secondary Storage and System Software: Disks, Magnetic Tape, Disk versus Tape; CD-ROM:		
5	Introduction, Physical Organization, Strengths and Weaknesses; Storage as Hierarchy, A journey of a Byte, Buffer Management, Input /Output in UNIX		
6	**Fundamental File Structure Concepts, Managing Files of Records :** Field and Record Organization, Using Classes to Manipulate Buffers,		
7	Using Inheritance for Record Buffer Classes, Managing Fixed Length,.		
8	Fixed Field Buffers, An Object-Oriented Class for Record Files,		
9	Record Access, More about Record Structures,		
10	Encapsulating Record Operations in a Single Class, File Access and File Organization		
c	**Application Areas**		
-	Students should be able employ / apply the Module learnings to . . .		
1	-		
2	Batch Processing Application		
d	**Review Questions**		
-			
1	What are file structures? Explain briefly the history of file structures design.		
2	Explain the different costs of disk access. Define i)seek time ii)rotational delay		

	iii)transfer time		
3	Explain the functions OPEN, READ and WRITE with parameters.		
4	Briefly explain the different basic ways to organize the data on a disk.		
5	Briefly explain the organization of data on Nine-Track tapes with a neat diagram		
6	With neat sketch, explain Unix directory structure		
7	Explain sector based data organization in magnetic disk.		
8	Differentiate between constant linear velocity (CLV) and constant angular velocity (CAV)		
9	Differentiate between physical file and logical file		
10	Discuss about the Fundamental File processing operations		
11	What are the major strengths and weekness of CD - ROM?		
12	What is a record? Explain different methods for organizing records of a file. Or Explain the different Record structures used in the organization of a file.		
13	Write a pack() and unpack() methods in C++ for employee id, employee name, employee designation, employee contact number fields for variable length records.		
14	What are self-describing files? How it is supported in fixed length record structures, explain with an example.		
15	What is the advantage of using inheritance for record buffer classes?		
e	**Experiences**	-	-

Module – 2

Title:		Appr Time:	10 Hrs
a	***Course Outcomes***	**CO**	**Blooms**
-		-	**Level**
1	Demonstrate Object Oriented concepts in C#	CO2	L3
b	***Course Schedule***	-	-
Class No	**Portion covered per hour**	**-**	**-**
1	**Organization of Files for Performance, Indexing:** Data Compression, Reclaiming Space in files,		
2	Internal Sorting and Binary Searching, Key sorting; What is an Index?		
3	A Simple Index for Entry-Sequenced File, Using Template Classes in C++ for Object I/O, Object-Oriented support for Indexed,		
4	Entry- Sequenced Files of Data Objects,		
5	Indexes that are too large to hold in Memory,		
6	Indexing to provide access by Multiple keys,		
7	Retrieval Using Combinations of Secondary Keys,		
8	Improving the Secondary Index structure: Inverted Lists,		
9	Selective indexes,		
10	Binding		
c	**Application Areas**	**-**	**-**
-	Students should be able employ / apply the Module learnings to . . .	-	-
1			
2			

d	**Review Questions**	-	-
-			
1	Explain the operations required to maintain the index files.		
2	What is redundancy reduction? Explain how run- length- encoding helps in redundancy reduction with an example		
3	Write an algorithm for searching a record from a file using i)binary search ii)sequential search		
4	Explain the limitations of binary searching and internal sorting.		
5	Explain how spaces can be reclaimed in files.		
6	What is an index? Explain a simple index for entry-sequenced file.		
7	Explain the advantages and disadvantages of 3 types of placement strategies.		
8	Explain the key sorting algorithm, with an example.	-	-
9	Discuss the advantages and disadvantages of indices that are too large to hold in memory.	CO3	L2
e	**Experiences**		
1			
2			

E1. CIA EXAM – 1

a. Model Question Paper - 1

Crs Code:	17IS62	Sem:	VI	Marks:	40	Time:	75 minutes
Course:	File Structures						

-	-	**Note: Answer all questions, each carry equal marks. Module : 1, 2**	**Marks**	**CO**	**Level**
1	a	What are file structures? Explain briefly the history of file structures design.			
	b	Explain the different costs of disk access. Define i)seek time ii)rotational delay iii)transfer time			
		OR			
2	a	Write an algorithm for searching a record from a file using i)binary search ii)sequential search			
	b	Explain the limitations of binary searching and internal sorting.			
3	a	Explain the limitations of binary searching and internal sorting.			
	b	Explain how spaces can be reclaimed in files.			
	c	What is an index? Explain a simple index for entry-sequenced file.			
		OR			
4	a	Write a pack() and unpack() methods in C++ for employee id, employee name, employee designation, employee contact number fields for variable length records.			
	b	What are self-describing files? How it is supported in fixed length record structures, explain with an example.			

b. Assignment -1

Crs Code:	17IS62	Sem:	VI	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	File Structures						

SNo	Assignment Description	Marks	CO	Level
1	What are file structures? Explain briefly the history of file structures design.	8		L2
2	Explain the different costs of disk access. Define i)seek time ii)rotational delay iii)transfer time	4		L2
3	Explain the functions OPEN, READ and WRITE with parameters.	6		L2
4	Briefly explain the different basic ways to organize the data on a disk.	4		L2
5	Briefly explain the organization of data on Nine-Track tapes with a neat diagram	6		L2
6	With neat sketch, explain Unix directory structure	6		L2
7	Explain sector based data organization in magnetic disk.	5		L2
8	Differentiate between constant linear velocity (CLV) and constant angular velocity (CAV)	6		L2
9	Differentiate between physical file and logical file	6		L2
10	Discuss about the Fundamental File processing operations	4		L2
11	What are the major strengths and weekness of CD - ROM?	5		L1
12	What is a record? Explain different methods for organizing records of a file. Or Explain the different Record structures used in the organization of a file.	8		L2
13	Write a pack() and unpack() methods in C++ for employee id, employee name, employee designation, employee contact number fields for variable length records.	4		L2
14	What are self-describing files? How it is supported in fixed length record structures, explain with an example.	4		L3
15	What is the advantage of using inheritance for record buffer classes?			L2
16	Explain the operations required to maintain the index files.			L2
17	What is redundancy reduction? Explain how run- length-encoding helps in redundancy reduction with an example			
18	Write an algorithm for searching a record from a file using i)binary search ii)sequential search			
19	Explain the limitations of binary searching and internal sorting.			
20	Explain how spaces can be reclaimed in files.			
21	What is an index? Explain a simple index for entry-sequenced file.			
22	Explain the advantages and disadvantages of 3 types of placement strategies.			
23	Explain the key sorting algorithm, with an example.			
24	Discuss the advantages and disadvantages of indices that are too large to hold in memory.			

D2. TEACHING PLAN - 2

Module – 3

Title:		Appr Time:	10 Hrs
a	***Course Outcomes***	**CO**	**Blooms**
-	At the end of the topic the student should be able to . . .	-	**Level**

b	***Course Schedule***		
Class No	**Portion covered per hour**	**-**	**-**
1	**Consequential Processing and the Sorting of Large Files:** A Model for Implementing Cosequential Processes,		
2	Application of the Model to a General Ledger Program,		
3	Extension of the Model to include Mutiway Merging,		
4	A Second Look at Sorting in Memory,		
5	Merging as a Way of Sorting Large Files on Disk.		
6	**Multi-Level Indexing and B-Trees:** The invention of B-Tree, Statement of the problem,		
7	Indexing with Binary Search Trees; Multi-Level Indexing,		
8	B-Trees, Example of Creating a B-Tree, An Object-Oriented		
9	Representation of B-Trees, B-Tree Methods; Nomenclature, Formal Definition of B-Tree Properties, Worst case Search Depth,		
10	Deletion, Merging and Redistribution, Redistribution during insertion; B* Trees, Buffering of pages; Virtual B-Trees; Variable-length		
c	**Application Areas**	**-**	**-**
-	Students should be able employ / apply the Module learnings to . . .	-	-
d	**Review Questions**	-	-
-	The attainment of the module learning assessed through following questions	-	-
1	What is co-sequential processing and what are the assumptions and components of the model?		
2	Explain the following: i) K-way merge ii) A selection tree for merging large number of lists.		
3	Explain the model for implementing the consequential processing and its applications to general ledger program.		
4	Describe how merging is used to sort large files on the disk.		
5	Write a note on conceptual tool kit for external sorting.		
6	What is a heap? Explain heap sorting with code and example.		
7	Explain the different ways to improve the performance of merge sort.		
8	Suppose you have 40MB of memory available for sorting the 80,000,000 records file where each record is of 100 bytes. i) How long does it take to sort the file using merge-sort algorithm. ii) Ho long it takes to sortthe file using key-sort algorithm.		
9	Write an algorithm for heap sorting method for insertion. Show the construction of heap tree for the following sequence FDCGHIBEA		
e	**Experiences**	-	-
1		CO6	L2
2			

Module – 4

Title:	Data Transmission and Telemetry Measurement of Non – Electrical Quantities	Appr Time:	10 Hrs

a	***Course Outcomes***	**CO**	**Blooms**
-	At the end of the topic the student should be able to . . .	-	**Level**
b	***Course Schedule***		
Class No	**Portion covered per hour**	**-**	**-**
1	**Indexed Sequential File Access and Prefix B + Trees:** Indexed Sequential Access,		
2	Maintaining a Sequence Set, Adding a Simple Index to the Sequence Set		
3	The Content of the Index: Separators Instead of Keys,		
4	The Simple Prefix B+ Tree and its maintenance,		
5	Index Set Block Size, Internal Structure of Index Set Blocks		
6	A Variable-order B- Tree		
7	Loading a Simple Prefix B+		
8	Trees, B-Trees,		
9	B+ Trees and Simple Prefix		
10	B+ Trees in Perspective.		
c	**Application Areas**	**-**	**-**
-	Students should be able employ / apply the Module learnings to . . .	-	-
d	**Review Questions**	-	-
-	The attainment of the module learning assessed through following questions	-	-
1	Write a note on AVL Trees		
2	What are paged binary trees? Explain the problems associated with paged binary trees.		
3	Give the formal definition of properties of B-Tree. Why is it called as "Bottom-up" tree.		
4	Mention the four properties of B* trees		
5	What are the two major drawbacks with binary search to search a simple sorted index on secondary storage.		
6	Show the B-Tree of order 4 that result from loading the following sets of keys in order i) CGJXNSUOAEBHIF ii)CSDAMPIBWNGURKE		
7	Explain with an example the creation of B-trees.		
8	Explain the following with respect to B-Tree: i) Worst-case search depth ii) Redistribution during insertion.		
9	What is multilevel indexing? Explain the concept of B - Trees in multilevel indexing with an example.		
10	Explain deletion, Merging and redistribution of elements in B – Tree		
e	**Experiences**	-	-
1		CO7	L2
2			

E2. CIA EXAM – 2

a. Model Question Paper - 2

Crs Code:	17IS62	Sem:	VI	Marks:	30	Time:	75 minutes		
Course:	File Structures								
-	-	**Note: Answer all questions, each carry equal marks. Module : 3, 4**						**Marks**	**CO**	**Level**
1	a	What is co-sequential processing and what are the assumptions and components of the model?								
	b	Explain the following: i) K-way merge ii) A selection tree for merging large number of lists.								
	c	Explain the model for implementing the consequential processing and its applications to general ledger program.								
		OR								
2	a	Show the B-Tree of order 4 that result from loading the following sets of keys in order i) CGJXNSUOAEBHIF ii)CSDAMPIBWNGURKE								
	b	Explain with an example the creation of B-trees.								
	c	Explain the following with respect to B-Tree: i) Worst-case search depth ii) Redistribution during insertion.								
3	a	Write a note on AVL Trees								
	b	What are paged binary trees? Explain the problems associated with paged binary trees.								
	c	Give the formal definition of properties of B-Tree. Why is it called as “Bottom- up” tree.								
		OR								
4	a	Explain the different ways to improve the performance of merge sort.								
	b	Suppose you have 40MB of memory available for sorting the 80,000,000 records file where each record is of 100 bytes. i) How long does it take to sort the file using merge-sort algorithm. ii) Ho long it takes to sortthe file using key-sort algorithm.								

b. Assignment – 2

Model Assignment Questions							
Crs Code:	17IS62	Sem:	VI	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	File Structures						

SNo	Assignment Description	Marks	CO	Level
1	What is co-sequential processing and what are the assumptions and components of the model?	6		
2	Explain the following: i) K-way merge ii) A selection tree for merging large number of lists.	4		
3	Explain the model for implementing the consequential processing and its applications to general ledger program.	6		
4	Describe how merging is used to sort large files on the disk.	6		
5	Write a note on conceptual tool kit for external sorting.	7		
6	What is a heap? Explain heap sorting with code and example.	4		
7	Explain the different ways to improve the performance of merge sort.	4		
8	Suppose you have 40MB of memory available for sorting the 80,000,000 records file where each record is of 100 bytes. i) How long does it take to sort the file using merge-sort algorithm. ii) Ho long it takes to sortthe file using key-sort algorithm.	4		

9	Write an algorithm for heap sorting method for insertion. Show the construction of heap tree for the following sequence FDCGHIBEA	4		
10	Write a note on AVL Trees	5		
11	What are paged binary trees? Explain the problems associated with paged binary trees.	6		
12	Give the formal definition of properties of B-Tree. Why is it called as "Bottom- up" tree.	7		
13	Mention the four properties of B* trees	4		
14	What are the two major drawbacks with binary search to search a simple sorted index on secondary storage.	5		
15	Show the B-Tree of order 4 that result from loading the following sets of keys in order i) CGJXNSUOAEBHIF ii)CSDAMPIBWNGURKE	8		
16	Explain with an example the creation of B-trees.	5		
17	Explain the following with respect to B-Tree: i) Worst-case search depth ii) Redistribution during insertion.	6		
18	What is multilevel indexing? Explain the concept of B - Trees in multilevel indexing with an example.	4		
19	Explain deletion, Merging and redistribution of elements in B – Tree	8		

D3. TEACHING PLAN - 3

Module – 5

Title:	Loop and Horn Antenna and Antenna Types	Appr Time:	10 Hrs
a	***Course Outcomes***	**CO**	**Blooms**
-	At the end of the topic the student should be able to . . .	-	**Level**
b	***Course Schedule***	-	-
Class No	**Portion covered per hour**	**-**	**-**
1	**Hashing:** Introduction, A Simple Hashing Algorithm		
2	Hashing Functions and Record Distribution,		
3	How much Extra Memory should be used?,		
4	Collision resolution by progressive overflow, Buckets,		
5	Making deletions, Other collision resolution techniques, Patterns of record access.		
6	**Extendible Hashing:** How Extendible Hashing Works,		
7	Implementation of Deletion		
8	Extendible Hashing Performance,		
9	Alternative Approaches.		
10	Alternative Approaches.		
c	**Application Areas**	**-**	**-**
-	Students should be able employ / apply the Module learnings to . . .	-	-
d	**Review Questions**	-	-
-	The attainment of the module learning assessed through following questions	-	-
1	What is hashing? Explain a simple hashing algorithm.		

2	What is collision? Explain collision resolution by progressive overflow.		
3	What is Hashing? Explain the different Hashing functions with an example.		
4	Discuss the issues that are involved in implementing the hashed file.		
5	Explain different methods used to avoid collision in hashing technique.		
6	Problems on hashing & overflow		
7	Explain the working of extendible hashing.		
8	Write short notes on: i) Dynamic hashing ii) Linear hashing		
9	Write short notes on Extendible hashing performance.		
10	Write a note on buddy-buckets.		
11	Write a short notes on: a. Extendible Hashing		
e	**Experiences**	-	-
1		CO10	L2
2		CO9	

E3. CIA EXAM – 3

a. Model Question Paper - 3

Crs Code:	17IS62	Sem:	VI	Marks:	30	Time:	75 minutes
Course:	File Structure						

-	-	**Note: Answer all questions, each carry equal marks. Module : 5**	**Marks**	**CO**	**Level**
1	a	What is collision? Explain collision resolution by progressive overflow.	8		
	b	What is Hashing? Explain the different Hashing functions with an example.	7		
		OR			
2	a	What is multilevel indexing? Explain the concept of B - Trees in multilevel indexing with an example.	7		
	b	Explain deletion, Merging and redistribution of elements in B – Tree	8		
3	a	Write an algorithm for heap sorting method for insertion. Show the construction of heap tree for the following sequence FDCGHIBEA	7		
	b	Write a note on AVL Trees	8		
		OR			
4	a	Write short notes on: i) Dynamic hashing ii) Linear hashing	8		
	B	Write short notes on Extendible hashing performance.	7		

	c	Write a note on buddy-buckets.			

b. Assignment – 3

Model Assignment Questions							
Crs Code:	17IS62	Sem:	VI	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	File Structures						

SNo	Assignment Description	Marks	CO	Level
1.	Explain how extendible hashing works.	6	CO5	L6
2.	Write short notes on dynamic hashing and linear hashing.	6	CO5	L6
3.	Define hashing explain a simple hashing algorithm.	7	CO5	L6
4.	What is collision? Explain the process of collision resolution by progressive overflow.	7	CO5	L6
5.	Define hashing. Differentiate between hashing and indexing.	5	CO5	L6
6.	Explain double hashing and progressive overflow in detail.	8	CO5	L6
7.	Write short note on buddy bucket.	5	CO5	L6

F. EXAM PREPARATION

1. University Model Question Paper

Course:	File Structures					Month / Year		
Crs Code:	17IS62	Sem:	VI	Marks:	60	Time:	180 minutes	
Module		Answer all FIVE full questions. All questions carry equal marks.				**Marks**	**CO**	**Level**
1	a	What are file structures? Explain briefly the history of file structures design.				08	CO1	L2
	b	Explain the different costs of disk access. Define i)seek time ii)rotational delay iii)transfer time				05	CO1	L3
	c	Explain the functions OPEN, READ and WRITE with parameters.				07	CO1	L3
		OR						
2	a	Write a pack() and unpack() methods in C++ for employee id, employee name, employee designation, employee contact number fields for variable length records.				08	CO1	L2
	b	What are self-describing files? How it is supported in fixed length record structures, explain with an example.				08	CO1	L3
	c	What is the advantage of using inheritance for record buffer classes?				04	CO1	L2

3	a	Explain the operations required to maintain the index files.	08	CO2	L2
	b	What is redundancy reduction? Explain how run- length- encoding helps in redundancy reduction with an example	06	CO2	L3
	c	Write an algorithm for searching a record from a file using i)binary search ii)sequential search	06	CO2	L2
		OR			
4	a	Explain the advantages and disadvantages of 3 types of placement strategies.	06	CO2	L2
	b	Explain the key sorting algorithm, with an example.	08	CO2	L3
	c	Discuss the advantages and disadvantages of indices that are too large to hold in memory.	06	CO2	L2
5	a	What is co-sequential processing and what are the assumptions and components of the model?	08	CO3	L3
	b	Explain the following: i) K-way merge ii) A selection tree for merging large number of lists.	07	CO3	L2
	c	Explain the model for implementing the consequential processing and its applications to general ledger program.	05	CO3	L2
		OR			
6	a	Explain the different ways to improve the performance of merge sort.	08	CO4	L2
	b	Suppose you have 40MB of memory available for sorting the 80,000,000 records file where each record is of 100 bytes. i) How long does it take to sort the file using merge-sort algorithm. ii) Ho long it takes to sort the file using key-sort algorithm.	06	CO4	L3
	c	Write an algorithm for heap sorting method for insertion. Show the construction of heap tree for the following sequence FDCGHIBEA	06	CO4	L2
7	a	Write a note on AVL Trees	08	CO5	L2
	b	What are paged binary trees? Explain the problems associated with paged binary trees.	05	CO5	L2
	c	Give the formal definition of properties of B-Tree. Why is it called as "Bottom- up" tree.	07	CO5	L2
		OR			
8	a	What are the two major drawbacks with binary search to search a simple sorted index on secondary storage.	05	CO6	L2
	b	Show the B-Tree of order 4 that result from loading the following sets of keys in order i) CGJXNSUOAEBHIF ii)CSDAMPIBWNGURKE	07	CO6	L2
	c	Explain with an example the creation of B-trees.	08	CO6	L2
9	a	What is collision? Explain collision resolution by progressive overflow.	08	CO7	L2
	b	What is Hashing? Explain the different Hashing functions with an example.	07	CO7	L4
	c	Discuss the issues that are involved in implementing the hashed file.	05	CO7	L4
		OR			
10	a	Write a note on buddy-buckets..	07	CO8	L3
	b	Write short notes on: i) Dynamic hashing ii) Linear hashing	05	CO8	L2
	c	Write short notes on Extendible hashing performance.	08	CO8	L2

2. SEE Important Questions

Course:	File Structures					Month / Year		
Crs Code:	17IS62	Sem:	VI	Crs Code:	17IS62	Sem:	VI	
	Note	Answer all FIVE full questions. All questions carry equal marks.				-	-	
Module	Qno.	Important Question				**Marks**	**CO**	**Year**
1	1	Briefly explain the organization of data on Nine-Track tapes with a neat diagram				10	CO1	2016

	2	With neat sketch, explain Unix directory structure	06	CO1	2016
	3	Explain sector based data organization in magnetic disk.	04	CO1	2016
	4	Differentiate between constant linear velocity (CLV) and constant angular velocity (CAV)	09	CO1	2016
	5	Differentiate between physical file and logical file	10	CO1	2017
2	1	Write an algorithm for searching a record from a file using i)binary search ii)sequential search	4	CO2	2017
	2	Explain the limitations of binary searching and internal sorting.	10	CO2	2017
	3	Explain how spaces can be reclaimed in files.	10	CO2	2017
	4	What is an index? Explain a simple index for entry-sequenced file.	05	CO2	2016
	5	Explain the advantages and disadvantages of 3 types of placement strategies.	06	CO2	2015
3	1	What is co-sequential processing and what are the assumptions and components of the model?	08	CO3	
	2	Explain the following: i) K-way merge ii) A selection tree for merging large number of lists.	05	CO3	
	3	Explain the model for implementing the consequential processing and its applications to general ledger program.	07	CO3	2016
	4	Describe how merging is used to sort large files on the disk.	5	CO4	
	5	Write a note on conceptual tool kit for external sorting.	5	CO4	
4	1	Show the B-Tree of order 4 that result from loading the following sets of keys in order i) CGJXNSUOAEBHIF ii)CSDAMPIBWNGURKE	08	CO5	
	2	Explain with an example the creation of B-trees.	05	CO6	
	3	Explain the following with respect to B-Tree: i) Worst-case search depth ii) Redistribution during insertion.	07	CO5	
	4	What is multilevel indexing? Explain the concept of B - Trees in multilevel indexing with an example.	08	CO6	
	5	Explain deletion, Merging and redistribution of elements in B – Tree	07	CO6	
5	1	What is collision? Explain collision resolution by progressive overflow.	08	CO7	2016
	2	What is Hashing? Explain the different Hashing functions with an example.	07	CO7	2010
	3	Discuss the issues that are involved in implementing the hashed file.	05	CO8	
	4	Explain different methods used to avoid collision in hashing technique.	07	CO8	2017
	5	Write a note on buddy-buckets.	05	CO8	2015

Course Outcome Computation

Academic Year:

Odd / Even semester

INTERNAL TEST					**T1**						**T2**	
Course Outcome	**CO1**		**CO2**		**CO3**		**CO4**		**CO5**		**CO6**	
QUESTION NO	**Q1**	**LV**	**Q2**	**LV**	**Q3**	**LV**	**Q1**	**LV**	**Q2**	**LV**	**Q3**	**LV**
MAX MARKS	10	-	10	-	10	-	10	-	10	-	10	-
USN-1	5	2	10				10	3	9	3	4	1
USN-2	5	2	8	3								
USN-3	7	3	7	3	10	3	8	3	8	3	5	2
USN-4					4	1	10	3	8	3	6	2
USN-5	8	3	6	2	9	3	10	3	8	3		
USN-6							10	3	9	3	4	1
Average CO Attainment		2.5		2.75		2.33		3		3		1.5

LV Threshold : 3:>60%, 2:>=50% and <=60%, 1: <=49%
CO1 Computation :(2+2+2+3)/4 = 10/4=2.5

PO Computation

Program Outcome	PO1		PO3		PO3		PO1		PO12		PO12	
Weight of CO - PO	3		1		3		2		2		3	
Course Outcome	CO1		CO2		CO3		CO4		CO5		CO6	
Test/Quiz/Lab	T1						T2					
QUESTION NO	Q1	LV	Q2	LV	Q3	LV	Q1	LV	Q2	LV	Q3	LV
MAX MARKS	10	-	10	-	10	-	10	-	10	-	10	-
USN-1	5	2	10	3			10	3	9	3	4	1
USN-2	5	2	8	3								
USN-3	7	3	7	3	10	3	8	3	8	3	5	2
USN-4					4	1	10	3	8	3	6	2
USN-5	8	3	6	2	9	3	10	3	8	3		
USN-6							10	3	9	3	4	1
Average CO Attainment		2.5		2.75		2.33		3		3		1.5