SANATAN DHARMA COLLEGE, AMBALA CANTT
College with Potential for Excellence, UGC, New Delhi
NAAC Accredited Grade "A+" with CGPA 3.51 in 3rd cycle
ISO 9001:2015 & ISO 14001:2015 Certified

DCSA-SDC
Modelling Excellence

Department of Computer Science
Lesson Plan (Session 2022-2023)

Class: BVSD-41   Sem: IV   Course Code: 41
Nomenclature: Computer and Programming Fundamentals
Dates: 2 Feb, 2023- 14 May, 2023

SYLLABUS
BVSD - 41 RDBMS - II

Maximum Marks: 100   External: 80
Time: 3 hours   Internal: 20

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Unit I

Object-oriented Data Model: Object identity, Object Structure, and Type Constructors, Encapsulation of Operations, Methods and Persistence, Type Hierarchies and Inheritance, Complex Objects, Polymorphism, Multiple Inheritance, Versions and Configurations.

Parallel and Distributed Databases and Client-Server Architecture: Architecture for Parallel Database; Distributed Database Concepts, Data Fragmentation, Replication, and Allocation Techniques, Overview of Client-Server Architecture.

Unit II

Data Warehousing: Characteristics of Data Warehouses, Operational Database Systems and Data Warehouse (OLTP & OLAP). Three-tier Data Warehouse Architecture, Data Mining: Introduction, Motivation, Importance, Knowledge Discovery Process, Functionalities, Classification of Data Mining Systems, Major issues, Applications of Data Mining.

Advanced Database Applications: Active Database Concepts, Temporal Database Concepts, Spatial Databases, Deductive Databases; Emerging Database Technologies: Mobile Databases, Multimedia Databases, Geographic Information System (GIS); Introduction to Web Databases and XML, Structure of XML Data.

Unit III

Introduction to Transaction Management: Transaction Model and Properties, Transaction Structure, Transaction Serialization and Recovery.

Concurrency Control – I: Lock Based Concurrency Control, Multi-phases Locking Protocols. Time Stamp Ordering, Serialization.

Concurrency Control – II: Optimistic Concurrency Control, Deadlock Management – Detection, Avoidance and Resolution. Distributed Deadlock, Structured (Top Actions, Distributed Nested) Transactions.

Unit IV

Recovery – I: Failure Analysis, Reliability and Availability, Sources of Failure, Recovery Techniques: Shadow Paging and Write-ahead Logging, Memory and Storage Management (Undo, Redo and Steal/Force).

Commit Protocols: Two Phase Commit, Presumed Abort, Presumed Commit, Three Phase Commit, Partitions, Replication and Voting, Shared-nothing DB, Scalability of Replication.

TEXT BOOKS:

- Elmasri Ramez and Navathe Shamkant B., Fundamentals of Database Systems, 5th Edition, Pearson Education, 2007
- Korth H.F. & Silverschatz A., Database Concepts, Tata McGraw Hill, New Delhi, 2010

Course Outcomes

After the completion of this course, prospective Computer professionals will have the ability to

CO No.	Course Outcomes
CO-1	Understand Data Warehouse fundamentals, Data MiningPrinciples
CO-2	Design data warehouse with dimensional modelling and applyOLAP operations.
CO-3	Understanding the use of XML format
CO-4	Build indexing mechanisms for efficient retrieval ofinformation from databases
CO-5	Apply appropriate security techniques database systems.
CO -6	Design distributed database for better resource management

S.No	Instructional Technique	Assessment Methods (AM)
1	Chalk & Talk	Assignments
2	ICT tools	Quiz
3	Group discussions	Group Discussions
4	Industrial visit	Oral Tests
5	Case studies	Sessional
6	Small Projects	Presentations
7	Workshop	Seminar
8	Spoken Tutorials	University Exams
9	Flipped Class	
10.	E-Resources	

Date	Topics to be covered	Instructional Technique	Assessment Method
02.02.2023	Object-oriented Data Model: Object identity, Object Structure, and Type Constructors	1	1,2,3,4
03.02.2023	Encapsulation of Operations, Methods and Persistence	1	1,2,3,4
04.02.2023	Type Hierarchies and Inheritance	1	1
05.02.2023	SUNDAY		
09.02.2023	Complex Objects	2-(PPT/Projector)	1,2,3,4
10.02.2023	Polymorphism, Multiple Inheritance, Versions and Configurations.	2-(PPT/Projector)	1,2,3,4
11.02.2023	Parallel and Distributed Databases and Client-Server Architecture:	2-(PPT/Projector)	1,2,3,4
12.02.2023	SUNDAY		
16.02.2023	Architecture for Parallel Database; Distributed Database Concepts	2-(PPT/Projector)	1,2,3,4
17.02.2023	Revision		
18.02.2023	HOLIDAY		
19.02.2023	SUNDAY		
23.02.2023	Data Fragmentation, Replication, and Allocation Techniques, Overview of Client-Server Architecture.	2-(PPT/Projector)	1,2,3,4
24.02.2023	Data Fragmentation, Replication, and Allocation Techniques, Overview of Client-Server Architecture.	2-(PPT/Projector)	1,2,3,4
25.02.2023	Data Fragmentation, Replication, and Allocation Techniques, Overview of Client-Server Architecture.	2-(PPT/Projector)	1,2,3,4

Date	Topic		
26.02.2023	**SUNDAY**		
02.03.2023	Data Warehousing: Characteristics of Data Warehouses, Operational Database Systems and Data Warehouse (OLTP & OLAP)..	**8,10,2**	**1,2,3,4,**
03.03.2023	Three-tier Data Warehouse Architecture, Data Mining: Introduction, Motivation, Importance,	**8,10,2**	**1,2,3,4,**
04.03.2023	Knowledge Discovery Process, Functionalities, Classification of Data Mining Systems, Major issues, Applications of Data Mining	**8,10,2**	**1,2,3,4,**
05.03.2023	**SUNDAY**		
16.03.2023	Advanced Database Applications: Active Database Concepts,	**6**	**1,2,3,4**
17.03.2023	Temporal Database Concepts, Spatial Databases, Deductive Databases;	**1**	**6**
18.03.2023	Emerging Database Technologies: Mobile Databases, Multimedia Databases, Geographic Information System (GIS);	**1**	**6**
19.03.2023	**SUNDAY**		
23.03.2023	**HOLIDAY**		
24.03.2023	Introduction to Web Databases and XML, Structure of XML Data.	**2-(PPT/Projector)**	**1,2,3,4**
25.03.2023	Introduction to Transaction Management: Transaction Model and Properties, Transaction Structure, Transaction Serialization and Recovery.	**2-(PPT/Projector)**	**1,2,3,4**
26.03.2023	**SUNDAY**		
30.03.2023	**HOLIDAY**		
31.03.2023	**Sessional**		
01.04.2023	Concurrency Control – I: Lock Based Concurrency Control, Multi-phases	**6**	**1,2,3,4**

Date	Topic	Method	References
	Locking Protocols. Time Stamp Ordering, Serialization.		
02.04.2023	**SUNDAY**		
06.04.2023	Concurrency Control – II: Optimistic Concurrency Control, Deadlock Management – Detection, Avoidance and Resolution..	**2-(PPT/Projector)**	**1,2,3,4**
07.04.2023	Distributed Deadlock, Structured (Top Actions, Distributed Nested) Transactions	**2-(PPT/Projector)**	**1,2,3,4**
08.04.2023	REVISION		
09.04.2023	**SUNDAY**		
13.04.2023	**CLASS TEST**		
14.04.2023	**HOLIDAY**		
15.04.2023	Recovery – I: Failure Analysis, Reliability and Availability, Sources of Failure	**9,10**	**1,2,3,4**
16.04.2023	**SUNDAY**		
20.04.2023	Recovery Techniques: Shadow Paging and Write-ahead Logging	**2-(PPT/Projector)**	**1,2,3,4**
21.04.2023	Memory and Storage Management (Undo, Redo and Steal/Force)	**2-(PPT/Projector)**	**1,2,3,4**
22.04.2023	**Holiday**		
23.04.2023	**SUNDAY**		
27.04.2023	Commit Protocols: Two Phase Commit, Presumed Abort,	**2-(PPT/Projector)**	**1,2,3,4**
28.04.2023	**Revision**		
29.04.2023	Presumed Commit,	**2-(PPT/Projector)**	**1,2,3,4**
30.04.2023	**SUNDAY**		
04.05.2023	Three Phase Commit, Partitions,	**2-(PPT/Projector)**	**1,2,3,4**
05.05.2023	Replication and Voting	**2-(PPT/Projector)**	**1,2,3,4**
06.05.2023	**Revision**		

07.05.2023	**SUNDAY**		
11.05.2023	Shared-nothing DB, Scalability of Replication	**2-(PPT/Projector)**	**1,2,3,4**
12.05.2023	Scalability of Replication	**2-(PPT/Projector)**	**1,2,3,4**
13.05.2023	Revision of Previous Years Question Papers		
14.05.2023	**SUNDAY**		

	Teacher Incharge	Head of the Department
Name	Arti Sachdeva	Dr. Girdhar Gopal
Sign with Date		