

**CO24057 : Object Oriented Programming Systems**  
**July-Dec 2022-23 SEM A**  
**B.Tech. II Year**

**Lecture Plan**

<b>Unit</b>	<b>Topic</b>	<b>Lectures</b>
<b>1</b>	<b>Introduction to Object Oriented Thinking &amp; Object Oriented Programming</b>	<b>05</b>
1.1	Introduction to object oriented programming, Comparison of procedure oriented & object oriented programming.	01
1.2	Features of object oriented programming, Merits and demerits of OO Methodology	01
1.3	Features of JAVA, Concept of JRE and JVM, Elements of OOPS	02
1.4	Object model, IO processing	01
<b>2</b>	<b>Encapsulation and Data Abstraction</b>	<b>08</b>
2.1	Concept of Objects: State, Behavior & Identity of an object	02

	2.2	Classes: identifying classes and candidates for Classes Attributes and Services	01
	2.3	Access modifiers, Static members of a Class, Scope and Lifetime, Instances, Message passing	02
	2.4	Construction and destruction of Objects, Types of constructors, Copy constructor	03
<b>3</b>		<b>Relationships</b>	<b>08</b>
	3.1	Inheritance: purpose and its types, 'is a' relationship	02
	3.2	Association and its types, Aggregation	02
	3.3	Concept of interfaces: how it is used in java	02
	3.4	Abstract classes: introduction and usage	02
<b>4</b>		<b>Polymorphism</b>	<b>06</b>
	4.1	Introduction to polymorphism, real world applications	01

	4.2	Method Overriding, implementation in java	02
	4.3	Method Overloading, and its implementation	02
	4.4	Static and runtime Polymorphism and its comparison	01
<b>5</b>		<b>Exception Handling &amp; Multithreading</b>	<b>13</b>
	5.1	Introduction to Strings, various methods of String class, packages for using strings in java	03
	5.2	Introduction to exceptions, Types of Exceptions, Exceptional handling, try, catch, throw, throws and finally with their usage, user defined exceptions	03
	5.3	Introduction to multithreading, its benefits and different stages of threads, implementation using Runnable interface and by extending Thread class	03
	5.4	Data collections, iterators, arraylist, etc.	02
	5.5	Case study like: ATM, Library management system.	02

**Ms. Teena Dubey**

## CO24009: Computer Architecture

July-Dec 2022-23 SEM A

B.Tech. II Year

### SUMMARY LECTURE PLAN:

S.No.	Topic	Lectures
1.	Unit-1 : Introduction to Computer Architecture.	07
2.	Unit-2 : Memory Organization	13
3.	Unit-3 : I/O & Interrupts	06
4.	Unit-4: Control Unit	05
5.	Unit-5: Pipelining	09
		40

### DETAILED LECTURE PLAN:

Lecture No.	
	<b>Unit-1 : Introduction to Computer Architecture</b>
1	CO's, Assessment policies, Scope of subject, What is covered? And what is not covered? Introduction to computer architecture, milestones in computer architecture.
2	Von neumen model: processor organization - ALU, CU, System bus,
3	Von neumen model: Memory, I/O.
4	Multilevel model of computer system
5	Types of system buses- data bus, control bus, address bus
6	Instruction Execution cycle, steps.
7	Introduction to assembly language.
	<b>QUIZ-1</b>
	<b>Unit-2 : Memory Organization</b>
9	Review of combinational circuits
10	Review of Sequential circuits
11	Introduction to memory organization- hierarchy, properties
12	Main memory, RAM memory, implementation
13	Associative memory, working
14	Cache memory, characteristics
15	Cache mapping techniques
16	Cache mapping techniques - GATE numericals
17	Cache Write policies
	<b>MST-1</b>
18	Instruction formats, Addressing modes
19	Addressing modes
20	Instruction types
21	RICS architecture, CISC architecture, comparison between RISC vs CISC
	<b>Unit-3 : I/O &amp; Interrupts</b>
22	Introduction to I/O mapping techniques, interface unit, device controller
23	Programmed I/O, Interrupts, Interrupt driven I/O

24	Memory mapped I/O and I/O mapped I/O
25	DMA, need, working of DMA, Modes of DMA
26	Serial & Parallel Communication
27	Computer Bus
	<b>QUIZ-2</b>
	<b>Unit-4: Control Unit</b>
28	Concept of Hard wired & Micro Programmed Control unit
29	Micro instructions
30	Instruction fetch & queuing
31	Micro instruction control
32	Design of micro architecture level
	<b>MST-2</b>
	<b>Unit-5: Pipelining</b>
33	On-chip parallelism- arithmetic pipelining
34	Instruction pipelining
35	Instruction pipelining -GATE Numericals
36	Hazards of pipelining- data hazard & its solutions
37	Control hazards & its solutions
38	Hazards of pipelining- GATE Numericals
39	Multi core Processor introduction
40	Multi core Processor architecture
	<b>QUIZ-3</b>

**Ms. Himani Mishra**

**B.Tech. III Year SEM A**  
**Lecture Plan for CO 34005: Database Management Systems**  
**August 2022-November 2022**

Total Number of Lectures: 40-45 (Approx.)

Name of Instructors: Dr. Vandan Tewari

**Pre Requisite of this course is good understanding of data structures and good programming skills**

<b>Course Outcomes : After completing the course student should be able to:</b>	
<b>CO1</b>	Compare & Contrast between traditional data processing and Database Management systems, its application and can describe design of a database at various levels.
<b>CO2</b>	Design a database using Entity Relationship diagram and other design techniques.
<b>CO3</b>	Apply fundamentals of relational model to model & implement a sample Database Management System for a given domain.
<b>CO4</b>	Query Database Management systems using SQL ; evaluate and optimize queries and apply concepts of transaction management

**UNIT I: (No of Lectures: 12) < Introduction to Databases their Architecture & Data Models >**

<b>S.No.</b>	<b>CONTENTS</b>	<b><u>Additional Resources</u></b>
Lect 1-2	Basic Concept, what is DBMS? Why do we need it? Basic DBMS Architecture, database languages View of data- Data abstraction, Data Integrity, universe of discourse.	<a href="http://www.nptelvideos.in/2012/11/database-management-system.html">http://www.nptelvideos.in/2012/11/database-management-system.html</a>
Lect 3-4	Instances and schemas, Data Independence. The three schema design, various type of data models, Database vs. conventional File systems/ data processing. Schemas and Instances, Database Users, overall system architecture, Database design. Disadvantages of a database.	
Lect 5-8	Requirement analysis, design issues, Introduction to ER Model & ER Diagram, ER Model: Basic Concepts: Type of Attributes, and Design issues: Cardinalities & Participation Constraints. Extended ER Model, Modeling using ER diagram and Case Study	Use <b>LUCIDCHART</b> to make some free ER Diagrams Check this: <a href="https://trevor.io/blog/top-7-entity-relationship-diagram-tools">https://trevor.io/blog/top-7-entity-relationship-diagram-tools</a>
Lect 9-11	Introduction to Relational model, domains, attributes & keys, comparison of ER model & Relational model	
Lect 12	Reduction of ER model to tables (Relations)	

**UNIT II (No. of Lectures:09) < Database languages & Query >**

<b>S.No.</b>	<b>CONTENTS</b>	<b><u>Additional Resources</u></b>
Lect13-14	Relational algebra: Queries with select, project, renaming, and joins; union intersection, difference & division operations	
Lect 15-16	SQL, The Structured Query Language, Various parts of SQL, Basic structure, the select from/where clause, DDL Vrs DMS & DCL statements.	<a href="https://www.cse.iitb.ac.in/infolab/Data/Courses/CS631/PostgreSQL-Resources">https://www.cse.iitb.ac.in/infolab/Data/Courses/CS631/PostgreSQL-Resources</a>
Lect 17-18	String operations, ordering, set operations, aggregate functions ,Null values usage & Nested sub queries set membership, set comparison, test for empty relation	
Lect 19	Test for absence of duplicate tuples, derived relations, and DML statements.	
Lect 20-21	Exercises on SQL Queries, Introduction to PL / SQL, Triggers, Cursors, Stored procedures.	

**UNIT III (No. of Lectures: 12) < Integrity Constraints , Normalization & Physical Database Design>**

<b>S.No.</b>	<b>CONTENTS</b>	<b><u>Additional Resources</u></b>
Lect 22-23	What are Integrity constraints? Why are they needed? Integrity constraints in ER model. Domain constraints, Referential Integrity. Effect of update operations on relations. Functional dependencies(F.D.),Trivial F D.	
Lect 24-25	Armstrong's axioms, closure of attribute sets. Algorithm for attribute closure calculation, significance of attribute closure & exercise on it. Closure of set of F.Ds,	
Lect 26	Canonical cover and computation of key, equality of set of FDs.	
Lect 27-29	Problems with relational database design, Introduction to normalization.1 NF, 2 NF, and 3 NF.3 NF vs. BCNF, attribute preservation & Loss less join decomposition, Denormalization.	
Lect 30-31	Physical DB Design: Type of file Organizations, Introduction to Hashing: Internal / External hashing, Collision resolution, Extendible hashing, RAID	<a href="https://www.postgresql.org/docs/current/static/storage.html">https://www.postgresql.org/docs/current/static/storage.html</a>
Lect 32-33	Indexing Techniques: primary & clustering indices, Secondary Index & Multilevel Index Tree Structured Index, B & B+ Trees, and Search Trees.	

## **UNIT IV (No. of Lectures:07) < Query Processing & Transaction Management >**

S.No.	CONTENTS	<b><u>Additional Resources</u></b>
Lect 34-35	Query Processing, Implementation of Select and join operations, Introduction to Query Optimization. Transactions, Operations, Properties (ACID) of transaction, Major actions of transactions.	<b><u><a href="https://www.postgresql.org/docs/current/static/view-pg-stats.html">https://www.postgresql.org/docs/current/static/view-pg-stats.html</a></u></b>
Lect 36	Concurrent Execution of Transaction; various types of anomalies arising out of them. Schedules, recoverability of schedule, serial schedule, serialisable schedule.	<b><u><a href="https://www.geeksforgeeks.org/sql-transactions/">https://www.geeksforgeeks.org/sql-transactions/</a></u></b>
Lect 37-38	Result equivalence & Conflict equivalence. Recovery Procedure, Structures for recovery procedures. Log with deferred updates & logging.	
Lect 39	Conflict serializability, serialization graph. Lock based concurrency control, 2PL protocol, strict 2PL & conservative 2PL.	
Lect 40	Deadlocks, Prevention & detection with & without time stamps, wait for graphs. Transaction Support in SQL.	

## **UNIT V (No of Lectures 01) < Case Study >**

Lect 32: Case Study of DBMS.

### **Text Books:**

- 1.R. Elmasri & S. Navathe, “ Fundamentals of Data base System” Pearson Education, 7e or later
- 2.H.F. Korth & A Silberschatz, “Database System Concepts” McGraw Hill, 7/e or later.

### **Reference Books:**

1. C.J. Date,” An introduction to database System, Addison Wesley, 6/e.

### **Online Resources:**

1. <https://www.w3schools.com/sql>
2. The Complete SQL Bootcamp @Udemy
3. Introduction to Databases and SQL Querying@Udemy
4. Database Management Systems By Prof P.P.Das @ Swayam Portal starting from 22/08/22: Registrations open right now.

### **Instructions to students:**

1. You are advised to attend classes sincerely & maintain proper attendance, do not join late in Lectures. Pl maintain discipline in the class .
2. You will be given 03 unscheduled online quizzes/design tests in this course, which will be evaluated, Do not even try to copy/Cheat else you will be given zero in entire evaluation.
3. There will be two scheduled tests and an open book test, which will be considered for evaluation.
4. You can contact me for your problems regarding subject matter by sending message on Subject Whatsapp group: DBMS 2022 CSE or by scheduling a in person meeting.
5. For DBMS Lab, you are advised to become comfortable with MYSQL/PostgreSQL/ORACLE LIVE
6. All need to join **Google classroom DBMS2022** as extra classes/tutorials/ lab demonstrations may be done online if required.
7. **Read the assigned chapter from the textbook before the lecture to understand the basic idea & terminologies used.**



**TENTATIVE SCHEDULE of Evaluation and Class Activities (Theory)**

S. No.	Name of Activity	Marks	Tentative date
1.	Class Activity-1: Designing an ER Diagram for a given Domain description (PEER-Reviewed) and discussing solutions	10	30/08/22/Week2
2.	Class Activity-2: Conversion of ER Diagram to Relational tables with identification of Keys. (PEER-Reviewed) and discussing solutions	10	14/09/22/Week5
3.a	Mid Term Test-1 : OPEN BOOK EXAM	20	As per Institute Calender
b	Discussion on Solution of Test1	-	Next Lecture after Test
4.	QUIZ-1	10	-
5.	Class Activity-3: Problem on Normalization (PEER-Reviewed)	10	10/10/22/Week8
6.	Class Activity-4: Problem of Concurrency in Transactions (PEER-Reviewed)(If Time permits)	10	20/10/22/Week10
7.	QUIZ-II	10	-
8.a	Mid Term Test-2 : Traditional Exam	20	As per Institute Calender
b	Discussion on Solution of Test1	-	Next Lecture after Test
*	Remedial Test (If required for selected students)	10	As time permits.

**TENTATIVE SCHEDULE of Evaluation in Practical lab**

S. No.	Name of Activity	Marks	Tentative date/Lab Turn
1.	Assignment1: Simple SQL Queries on pre prepared and populated University and Railway database.	10	30/08/22/ III
2.	Quiz-1	10	30/08/22/ III
3.	Assignment2: Nested SQL Queries on pre prepared and populated University and Railway database.	10	13/09/22/ V
4.	Quiz-2	10	13/09/22/ V
5.	Assignment3: Complex SQL Queries on self prepared and populated commercial order database.	10	27/09/22/ VII
6.	Assignment 4: Triggers/cursors/Stored Procedures	10	06/10/22/ IX
7.	Quiz-3	10	06/10/22/ IX
8.	MINI PROJECT (Team of Four/Five)(4 submissions) Requirement Analysis ER Diagram Conversion to Relational Model Complete Implementation	30	31/08/22/ III 07/09/22/ IV 13/09/22/ V 10/10/22/ X

**B.Tech. III Year SEM A**  
**Lecture Plan**  
**CO 34298: Artificial Intelligence**

<b>Total No. of Lectures: 40</b>
<b>Unit I (No. of Lectures: 10) Introduction to Artificial Intelligence</b>
Lecture 01: Introduction: Basics, the Foundations of AI
Lecture 02: Intelligent Agents
Lecture 03: Problem Solving by Searching
Lecture 04: Problem spaces and search
Lecture 05: Uninformed strategies
Lecture 06-08: Informed Strategies
Lecture 09-10-: Adversarial Search
<b>Unit II (No. of Lectures: 10) Knowledge Representation</b>
Lecture 11-13: Knowledge-Based Agents
Lecture 14-16: Propositional Logic and Predicate Logic
Lecture 17-18: First Order Logic and Inference
Lecture 19-20: Semantic Networks, Categories
<b>Unit III (No. of Lectures: 10): Reasoning</b>
Lecture 21-22: Quantifying Uncertainty
Lecture 23-24: Baye's Rule and Naive Bayes Models
Lecture 25-26: Probabilistic Reasoning
Lecture 27-28: Bayesian Networks
Lecture 29-30: Temporal Models

<b>Unit IV (No. of Lectures: 06) Expert Systems, Natural Language Processing</b>
Lecture 31-32: Features and Roles of Expert Systems
Lecture 33-34: Knowledge Representation in Expert Systems
Lecture 35-36: Natural Language Processing
<b><u>Unit V (No. of Lectures: 04)</u></b>
Lecture 37: Introduction to Neural Networks
Lecture 38: Introduction to Fuzzy Systems
Lecture 39: Introduction to Genetic Algorithm
Lecture 40: Computer-Vision, Robotic

**Ms. Neha Mehra**

**B.Tech. III Year SEM A**  
**Lecture Plan**  
**CO34014: Agile Software Methodology**  
**Total Lectures:40**

S.No	Unit	Topic to be covered	No of Lectures
1	I	Fundamentals of Software Engineering Concepts and Process	1
2	I	Software Development Life Cycle, Important Steps and Effort Distribution	2
3	I	Prototype Model, Incremental Model	1
4	I	Spiral Model, RAD	2
5	II	The Genesis of Agile, Introduction and background	1
6	II	Agile Manifesto and principles	1
7	II	Agile development Lifecycle	1
8	II	Agile Development Methods: Adaptive Software Development (ASD), Dynamic Systems Development Methods (DSDM)	1
9	II	Extreme Programming (XP): XP lifecycle	2
10	II	Feature Driven development,	1
11	II	Lean Software Development, Kanban	1
12	II	Agile project management	1
13	II	Test Driven Development, Key Principles, Examples, and Tools & Techniques for each Agile development methods	1
14	III	Impact of Agile Processes in Requirement Engineering Requirements Elicitation and Management	1
15	III	Agility in Design, Agile Architecture, Agile Design Practices	1
16	III	Role of Design Principles, Agile Product Development	1
17	III	Automated build tools, Continuous Integration, Continuous Deployment, Refactoring, Team Dynamics and Collaboration	1

18	III	Introduction to Scrum, Agile Principles - Sprints Introduction, User Stories and Product Backlog	1
19	III	Estimation, Velocity, Burndown chart, Sprint Zero	1
20	III	Roles - Team Management and Structures, Product Owner, ScrumMaster / Team Lead, Implementation Team Members	1
21	III	Planning in Scrum - Planning, Planning Stakeholders	1
22	IV	Planning Types (Portfolio, Product and Sprint)	1
23	IV	Sprint phases/meeting - Sprint Planning, Sprint Review, Sprint Retrospective, Product Demo, Daily Scrum calls	3
24	V	Agile Testing Principles, Practice and Processes	1
25	V	Difference between Testing in Traditional and Agile Approaches	1
26	V	Agile testing methods, techniques and tools	1
27	V	Estimating Test Efforts, Agile Metrics and Measurements	1
28	V	Agile Control: the 7 control parameters; Product Quality	1
29	V	Agile approach to Risk	2
30	V	Agile Approach to Configuration Management	1
31	V	Agility and Quality Assurance	1
32	V	Case study using any one of the framework	3

#### LAB PLAN AGILE

S.No	Lab Work	No. of labs required
1	IEEE standard SRS Formation	2
2	UML Diagrams	2
3	User stories and Test case designing	2
4	Iteration of sprints/ Sprint review and retrospective	4
5	Prototype Submission	1

**Ms. Priyanka Kokate**

**B.Tech. III Year SEM A****Lecture Plan  
CO34002: TOC  
Total Lectures:40**

S.No	Unit	Topic to be covered	Lecture No.
	<b>I</b>	Review of sets, Relations and functions	2
		Graphs, Trees	1
		Proof Techniques: Addition forms of proof, Inductive proof	1
		Languages and Grammars- Fundamental concepts	1
		Predicate Calculus.	1
	<b>II</b>	DFAs	1
		NFAs(with and without Epsilon transitions)	1
		Regular Expressions and Languages	2
		Closure properties of Reg. Language	2
		Equivalence and minimization of Autometa	1
		My-hill Narode Theorem.	1
		Conversion: Reg. Exp. to DFA and DFA to Reg. Exp.	2
		Properties of Regular languages	1
		Pumping Lemma of Regular Languages	2
	<b>III</b>	CFG	1
		Parsing, Ambiguity	1
		Non-deterministic PDAs	1
		Normal Form of CFGs,	2
		CFG to NPDA	1
		NPDA to CFGs	1
		Deterministic PDA	1
		Pumping Lemma for CFGs.	1
	<b>IV</b>	Turing Machine as acceptor	2
		Recognizing a languages	1
		Universal TMs	1
		Linear bounded Autometa	1
		Context Sensitive Languages	1
		Recursively Enumerable Languages	1
		Unrestricted Grammars	1
	<b>V</b>	Chomsky Hierarchy	1
		Concept of Solvability and Unsolvability	1
		Church's Thesis,	1
		Complexity Theory- P and NP problems	1
		Introduction to Pteri Nets.	1

**B.Tech IV year Sem A**  
**Lesson Plan**  
**CO44308: Web Technology**

**SUMMARY LECTURE PLAN:**

S No	Topic	No of Lectures
1.	Unit 1: HTTP, HTML, DHTML,CSS PREPROCESSORS-SASS,LESS	8
2.	Unit 2: Browsers and Search Engine	5
3.	Unit 3: Client-side Programming and Server-side Programming	11
4.	Unit 4: Introduction to Document Object Model	8
5.	Unit 5: XML, Web site planning and design ,Selenium web driver	8

**DETAILED LECTURE PLAN:**

**Lecture Plan**

<u>Unit</u>	<u>Topics</u>	<u>No. Of Lectures</u>
1.1	Introduction to the Internet,Overview of TCP/IP protocol suit	1
1.2	HTTP: Headers, working, methods	1
1.3	MIME type and content encoding	1
1.4	Session tracking and Cookies;	1
1.5	Web Sockets;HTML–SGML, Basic HTML Elements,	1
1.6	SASS(Syntactically Awesome Stylesheet)	1
1.7	LESS(Leaner Style Sheets)	1
1.8	CSS(Cascading style sheet)	1
2.1	Browser: Working of a Browser, Plug-ins;	2
2.2	Study of one browser such as Internet Explorer, MozillaFirefox	1
2.4	Search Engines- Evolution of search engines,	2
	Working of Search Engines; Search strategies, indexing.	
3.1	Client Side Programming: Java Script, Angular Js	3
3.2	Javascript Regular expressions	2

3.3	Advanced Javascript and AJAX	2
3.4	Java Spring (IOC Container,Dependency Injection,Setter injection,Constructor Injection)	4
4.1	Browsers and the DOM, Introduction to the DocumentObject Model	3
4.2	Intrinsic Event Handling, Modifying Element Style, TheDocument Tree, DOM Event Handling	3
4.3	Accommodating Noncompliant Browsers, Additional Properties of window	2
5.1	XML – Basic Standards, Namespaces,	1
5.2	DTDS, XML Schema,	1
5.3	Linking & Presentation Standards,	1
5.4	Parsing XML, XPath, XML Transformation;	3
5.5	Web site planning and design; Application lifecycle;	2
	SELENIUM web driver	
	<b>Total</b>	<b>40</b>

**Ms. Mamta Gupta**