Branch   : **Computer Engg.**   Semester: **4th**

Subject   : **Database Management System**   Session: **Feb-2025**

Teacher   : **Vikas Soni**   Class Room: **LH03**

Sr. No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1.	1-8	**Introduction to Database Systems**	Database Systems, Database and its Purpose, Comparison of Database Approach with File-based and Traditional Record Keeping Approaches, Advantages and Disadvantages of Database Approach, Classification of Database Users, Role of DBA	**R3,R2**	
2.	9-20	**Database System Concepts and Architecture**	Data Models, Schemas, and Instances; ANSI/SPARC Architecture of a Database System, External Level, Conceptual Level, Internal Level, Mappings; Data Independence, Logical Data Independence, Physical Data Independence	**R3,R2**	
3.	21-30	**Relational and E-R Models**	Relational Database Model, Relations, Attributes, Tuples, Domains; Prime and Non-prime Attributes, Key – Primary Key, Candidate Keys, Alternate Keys, Superkey, Secondary Key, Foreign Keys; Database Constraints, Entity Relationship Model - Entity, Entity Sets, Strong and Weak Entities, Attributes, and Keys; Association, Relationship, Roles, Structural Constraints, ER Diagrams	**R3,R2**	
4.	31-40	**Database Dependencies and Normalization**	Functional Dependencies, Trivial and Non-trivial Dependencies, Non-Loss Decomposition, Normalization, First, Second and Third Normal Forms, Boyce-Codd Normal Form	**R3,R2**	
5.	41-52	**Overview of MySQL**	MySQL, Features of MySQL, Database Objects - Database, Table, View, Index, Alias; MySQL Object Naming, Keywords, User-defined Variables, Data Types - Numeric, Date and Time, String Types; Operators: Arithmetic, Logical, Relational, String; MySQL System Schema, MySQL Database Users and Roles, Database Privileges, Access Control and Account Management, MySQL Server and MySQL Client	**R1,R3**	
6.	53-64	**Structure Query Language using MySQL**	SQL, DDL Statements : CREATE, DROP, ALTER, RENAME; DML Statements: INSERT, UPDATE , DELETE, SELECT; SELECT Clauses - FROM, WHERE, ORDER BY, GROUP BY, HAVING; Join Operations - Inner, Left, Right and Outer Joins; Subqueries, Set Operations - Union, Intersect, Minus; GRANT and REVOKE Privileges; Transaction Statements -	**R1,R3**	

| | | | COMMIT, ROLLBACK, SAVEPOINT; Prepared Statements, SQL Functions - ABS, ROUND, FLOOR, CEIL, SQRT, POWER, TRUNCATE, LOG, NOW, DATE, TIME, CURDATE, CURTIME, DAY, MONTH, YEAR, DATEDIFF, DATE_SUB, DATE_ADD, DATE_FORMAT, CONCACT, LENGTH, UPPER, LOWER, LEFT, RIGHT, LTRIM, RTRIM, MAX, MIN, SUM, AVG, COUNT, CAST, STR_TO_DATE | | |

R1-Fundamentals of Database Systems by ElmasriRamez&NavatheShamkant, Pearson Education
R2-An Introduction to Database Systems by C.J. Date, Pearson Education
R3-MySQL tutorials at ttps://www.w3schools.com/mysql

Signature of Teacher with Date   Signature of H.O.D.

Govt. Polytechnic Hamirpur (H.P.)
Practical Planning & Coverage

Branch : **Computer Engg.**   Semester: **4th**

Subject : **Database Management System**   Session: **Feb - June 2025**

Teacher : **Vikas Soni**   Laboratory: APL Lab

Pract. No.	Description of Practical	Reference for Procedure/ Writeup	Signature
1.	To install and configure MySQL database server on Windows or Linux machines.	Lab Manual	
2.	To create database tables having columns with different data types, widths and precisions	Lab Manual	
3.	To alter existing database tables to add new columns, delete existing columns and change column names, data types and widths.	Lab Manual	
4.	To apply integrity constraints - PRIMARY KEY, NOT NULL, UNIQUE, CHECK, FOREIGN KEY, to the database tables.	Lab Manual	
5.	To insert data in a table having columns of different data types (INSERT statement).	Lab Manual	
6.	To view the data stored in different tables using the SELECT statement. Apply WHERE, HAVING, ORDER BY and GROUP BY clauses with SELECT.	Lab Manual	
7.	To demonstrate join operation on tables using left, right and inner join.	Lab Manual	
8.	To demonstrate at least 10 SQL row functions in queries.	Lab Manual	
9.	To demonstrate SUM, MAX, MIN, COUNT aggregate functions and also demonstrate the use of HAVING and GROUP BY clauses in SELECT statement.	Lab Manual	
10.	To use WHERE, HAVING, ORDER BY and GROUP BY clauses with SELECT.Case Study : Student Database – The case study project must identify various entities related to the students in a typical academic institution, draw E-R diagrams, Apply Database Normalization, Create Tables, Apply Database Constraints, Insert data, Delete Data and Query the Database etc.	Lab Manual	

Signature of Teacher

Signature of H.O.D.

Govt. Polytechnic Hamirpur (H.P.)

Lesson Plan: Data Structure and Algorithms

Branch: **Computer Engg.**   Semester: **4th**

Subject: **DSA**   Teacher: **AMIT NAYYER**

Class Mode: **Offline**

Proposed lesson Plan

Lecture Number	Topics to be covered	Reference/ Resource	Remarks
	Unit 1 : Introduction		
1	Algorithms-Definition, Characteristics	R3	Lecture delivery will be through classroom teaching and Notes will be shared during lecture
2	Efficiency	R3, R2	
3	Notations - Asymptotic	R3, R2	
4	Big-Oh, Omega	R2,	
5	Theta notation	R1	
6	Data Types	R1	
7	Data Structures - Characteristics	R2	
8	Linear, Non-linear		
9	General Operations, Efficiency		
	Unit 2 : Arrays, Structure and Pointers		
10	Arrays	R3	Lecture delivery will be through classroom teaching and Notes will be shared during lecture
11	One-Dimensional and Multi-Dimensional Arrays	R3	
12	One-Dimensional Arrays Memory Representation	R3	
13	Traversal	R3	
14	Insertion and Deletion	R1	
15	Sorting	R2	
16	Searching	R3	
17	Two-Dimensional Arrays–Memory Representation	R1	
18	Implement Matrices using Two-Dimensional Arrays		
19	Matrix Operations-Addition, Subtraction		
20	Multiplication, Transpose		
21	Structure		
22	Accessing structure members using (.) and (->) operators		
23	Self referencing structures		
24	Pointers		
25	Dynamic Memory Allocation using malloc(), calloc()		
26	free() and realloc(),		
27	Manipulate Arrays using Pointers		

	Unit 3 : Sorting and Searching		
28	Searching Techniques - Linear Search	R3	Lecture delivery will be through classroom teaching as well as power point presentations.
29	Binary Search	R3	
30	Sorting Techniques	R3, R2	
31	Selection Sort	R3, R2	
32	Insertion Sort	R2,	
33	Bubble Sort	R1	
34	Quick Sort	R1	
35	Merge Sort		
36	Efficiencies of Sorting Algorithm		
	Unit 4 : Linear Data Structure		
37	Linked Lists – Representation, , Advantages, Disadvantages	R2	Lecture delivery will be through classroom teaching and Notes will be shared during lecture
38	Implementation, Operations.	R1	
39	Doubly Linked List	R1	
40	Stacks, Stack Operations - Push, Pop	R2	
41	Implementation of Stack using Arrays and Linked List	R2	
42	Queues	R3	
43	Queue Operations	R3	
44	Implementation of Queue using Arrays	R2	
45	Implementation of Queue using Linked List		
	Unit 5 : Non Linear Data Structures		
46	Trees, Tree Terminology - Node, Root, Parent, Children, Sibling, Edge, Leaves	R3, R2	Lecture delivery will be through classroom teaching and Notes will be shared during lecture
47	Binary Tree, Binary Tree Representation	R3, R2	
48	Binary Tree Traversal	R2,	
49	Binary Search Tree	R1	
50	Graphs, Graph Terminology	R1	
51	Directed Graphs	R2	
52	Weighted Graphs	R3	
53	Graph Implementation using Adjacency Matrix	R2	
54	Graph Implementation using Adjacency List		

Teaching Resources:78
R1: Data Structures, R.S. Salaria, Khanna Book Publishing, New Delhi
R2. Data Structures Using C, Reema Thareja, Oxford University Press India.
R3 Online Data structure tutorials at https://dsa-tutorial.info

Date:
Teacher Signature

Date:

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Practical Planning

Branch: Computer Engineering   **Semester: 4th**

Subject: Data Structure and Algorithm   **Session**: Jan 2025

Teacher: Amit Nayyer   **Laboratory**: Yes

Sr. No.	No of Practical hours planned	Aim of the Practical	Reference for Procedure/ Writeup	Remarks
1	4	To insert and delete elements at specified location in an array.	R2	
2	2	To search an element in an array using linear search.	R1, R3	
3	2	To search an element in a sorted array using binary search.	R1, R3	
4	2	To sort elements of a given array in ascending order using selection sort method.	R1, R3	
5	2	To sort elements of a given array in ascending order using bubble sort method.	R1, R3	
6	2	To sort elements of a given array in ascending order using quick sort method.	R1, R3	
7	2	To sort elements of a given array in descending order using insertion sort technique	R1, R3	
8	4	To sort elements of a given array in descending order using merge sort technique.	R1, R3	
9	6	To implement a stack and demonstrate push, pop and peek operations on it	R2	
10	6	To implement a queue and demonstrate various operations on it.	R1, R3	
11	6	To implement a circular-queue and demonstrate various operations on it		
12	4	To implement a linked list and demonstrate insertion, deletion and traversing operations on it.	R1, R3	
13	4	To implement a doubly linked list and demonstrate insertion, deletion and traversing operations.	R2	
14	4	To implement a tree and perform in-order, pre-order and post-order traversals.	R1, R3	
15	4	To implement a binary search tree and perform insertion, deletion and search operations on it.		

Signature of Teacher with Date   **Signature of HOD**

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Lesson Planning and Coverage

Branch: Computer Engineering **Semester:** 4th

Subject: Advanced Computer Networks **Session**: Jan -June 2024

Teacher: Ritesh Avasthi

Sr. No.	No of Lectures	Chapter/Unit Description	Detailed contents	Reference Resources	Remarks
1	14	UNIT 1	Review of Networking Basics; Advance Topics in IPv4 – Subnetting, Multicasting, Multicast Routing Protocols (IGMP, PIM, DVMRP); Advance Topics in TCP – flow management, congestion avoidance, protocol spoofing; Ipv6	R1,R2	
2	14	UNIT 2	Telecom Networks, Switching Techniques; Introduction to Frame Relay, ATM, MPLS; VSAT Communication – Star and Mesh architectures, bandwidth reservation; Wireless Networks – WiFi, WiMax, Cellular Phone Technologies – GSM, CDMA, 3G, 4G	R2	
3	12	UNIT 3	Network Redundancy, Load Balancers, Caching, Storage Networks; QoS; Network Monitoring – SNMP, RMON;	R3	
4	12	UNIT 4	Introduction to Network Security – VLAN, VPN, Firewall, IPS, Proxy Servers	R3,R4	
5	12	UNIT 5	Network Simulation, Network design case studies and exercises, IP Addressing schema, Protocol Analysers (Wireshark, etc)	R4	

References:

R1. RFCs and Standards Documents (www.ietf.org and other standard body websites)

R2. Data Communications and Networking by Behrouz A. Forouzan, TMH.

R3. https://nptel.ac.in

R4. https://www.w3schools.com -

COURSE OUTCOMES:

After completing this course students will be able to:

CO-1   Understand sub netting and routing protocols.

CO-2   Explain various switching techniques and understand wireless networks.

CO-3   Understand network redundancy and various network security issues.

CO-4   Simulate and study a network

Signature of Teacher with Date

Signature of HOD

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Lesson Planning and Coverage

Branch: Computer Engineering

Semester: 4th

Subject: Wireless Communication

Session: Jan -June 2025

Teacher: Varun Gupta

Sr. No.	No of Lectures	Chapter/ Unit Description	Detailed contents	Reference Resources	Remarks
1	10	**UNIT 1** Introduction to Wireless Communication	Wireless communication and its applications, advantages and disadvantages of wireless communication, Types of Services: broadcast, paging, cellular telephony, trunking radio, cordless telephony, WLAN, PAN, adhoc & sensor networks, fixed wireless access; challenges in wireless communication.	R1	
2	08	**UNIT 2** Electromagnetic Spectrum	Electromagnetic spectrum, licensed/unlicensed spectrum bands, ISM band, terrestrial and satellite microwave communication, broadcast radio, infrared and light wave communication, wireless transmission impairments – attenuation, distortion, noise, interference, path loss, shadowing and fading.	R1,R2	
3	12	**UNIT 3** Fundamentals of Wireless Communication	Concept of bandwidth, analog and digital signals, data rate, signal strength, SNR, RSSI, electromagnetic wave propagation: ground waves, sky waves and line-of-sight propagation; radio waves, microwaves, infrared; Overview of Propagation Mechanisms: reflection, diffraction and scattering; outdoor and indoor propagation.	R1,R2,R3	
4	12	**UNIT 4** Cellular Architecture	Cellular Communication: cellular concept, cellular system architecture, cells, clusters, frequency reuse, cell splitting, handoff, Digital Cellular System: TDMA, ETDM, PCS, CDMA, Global System for Mobile Communication (GSM), GSM network: switching system, BSS, operation and support system, Generations of cellular networks and their features (1G – 5G).	R1,R2,R3	

| 5 | 06 | **UNIT 5** Wireless LAN Technology and Bluetooth | Wireless LAN (WLAN), IEEE-802.11, WLAN applications, WLAN types, WLAN problems – hidden station and exposed station problems; Bluetooth technology, Direct Sequence Spectrum Scheme, Frequency Hopping Spread Spectrum, Personal Area Networks. | R1,R2,R3 | |

References:

R1. Mobile Computing: Technology, Applications and Service Creation by Asokek Talukdarand Roop R. Yavagal, TMA.

R2. Wireless Communication and Networking- William Stalings, PHI.

R3. https://W3schools.com/

COURSE OUTCOMES:

After completing this course students will be able to:

CO-1   Explain various wireless communication technologies

CO-2   Understand electromagnetic spectrum and transmission impairments.

CO-3   Explain various propagation modes for wireless communication.

CO-4   Understand the architecture of cellular communication.

CO-5   Understand Bluetooth standard for wireless communication.

Signature of Teacher with Date   **Signature of HOD**

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Lesson Planning and Coverage (Practical)

Branch: Computer Engineering   **Semester:** 4th

Subject: Wireless Communication   **Session**: Jan -June 2025

Teacher: Varun Gupta   **Laboratory**: Yes

Sr. No.	No of Lectures	Chapter/ Unit Description	Detailed contents	Reference Resources	Remarks
1	10	**PRACTICAL 1**	To identify various wireless networking devices and to recognise physical topology in the lab.	R1	
2	08	**PRACTICAL 2**	To create WLAN of at least five wireless devices using any simulation tool (e.g. Packet tracer).	R1,R2	
3	12	**PRACTICAL 3**	To setup a WLAN using access point.	R1,R2	
4	12	**PRACTICAL 4**	Data sharing using Bluetooth.	R1,R2	
5	06	**PRACTICAL 5**	To transfer data between two wireless devices (e.g.PC-PC, PC-Smart phone)	R1,R2	
5	06	**PRACTICAL 6**	To install, configure and use a Printer with WiFi.	R1,R2	

References:

R1. LAB Manual

R2. https://tutorialspoint.com

R3. https://W3schools.com/

Signature of Teacher with Date   **Signature of HOD**

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Lesson Planning

Branch: Computer Engineering

Semester: 4th

Subject: Essence of Indian Knowledge & Tradition

Session: Jan 2025

Laboratory: NO

Teacher: Indu Bala

Sr. No.	No of Lectures	Chapter/Unit Description	Detailed contents	Reference Resources	Remarks
1	8	Indian Knowledge System (IKS)	Introduction and Function of Indian Knowledge System(IKS). 🎬 The Basic Structure of Indian Knowledge System(IKS) (only Introduction) 1. The 4 Vedas, Namly ऋ ेद (Rigveda) ,यजु व द (Yajurveda),सामवे द (Samaveda) ,अथववे द (Atharvaveda) . 2. The 4 UpVedas, Namely आयु व द (Ayurveda (health-care)), धनु व द (Dhanurveda (archery)), गंधववेद (Gandharva-veda (dance, music etc.)) and थाप वे द (Sthapatyaveda (architecture)). 3. The 6 Vedagangs ,namelyShiksha (िश ा), Kalpa (क Chhandas छं दस्),Nirukta (िन), and Jyotisha( ),Vykaraṇa (ाकरण), िोतष). 4. Itihasa (इितहास)(Ramayana रामायण and Mahabharata महाभारत) and Purana पु राण (Vishnupuranaिव पुराण, BhagavataPurana (भागवतपु राण) etc.)Dharmashatra धमशा (Manusmriti मन ित, Yajnavalkya-smriti या व ित, etc.). 6. Darshan दशन (आ 7. Nyaya कतथाना ाय (Logic तक शा क). andEpistemology ानमीमां सा).	R1,R2,R3	
2	6	Modern Science	Modern science: Introduction, Characteristics, importance and Example ● Difference between modern Science and Indian knowledge system ● Role of IKS in modern science	R1,R2,R3	
3	8	Traditional knowledge	Traditional knowledge: Definition, nature, characteristics, scope and importance ● Indigenous Knowledge (IK): characteristics ● Traditional knowledge vis-a-vis	R1,R2,R3	

			Indigenous knowledge ● Traditional knowledge Vs western knowledge ● The need for protecting traditional knowledge		
4	5	Yoga and Holistic Health Care	Yoga: Meaning and Importance of Yoga 15 Marks ● Yoga and physical health, Yoga and psychological health, Yoga and intellectual health, Yoga and spiritual health, Yoga and social approach. ● Introduction to Ashtanga Yoga, Yogic Kriyas (Shat Karma) ● Pranayama and its types; Active lifestyle and stress management through Yoga ● Physical Fitness, Health and wellness: Meaning and Importance of Wellness, ● Components of Wellness, Health and physical Fitness; ● Traditional sports & Regional Games for promoting wellness: ● Leadership through Physical Activity and Sports; Introduction to First Aid.	R1,R2,R3	
5	5	Himachal Pradesh: A Basic Information	History, Culture, Heritage/ Tradition, Customs & Manners, ● Regional Knowledge, Geographical Features, Constitutional History ● Tourism Place & Scope ● Festivals and Fairs	R1,R2,R3	

Reference Books:

1.Cultural Heritage of India-Course Material by V. SivaramakrishnaBharatiya, VidyaBhavan,

2.Himachal Pradesh History, Culture & Economy by MianGoverdhan Singh & Prof. Dr. C.L. Gupta.

 3.Modern Physics and Vedant by Swami JitatmanandBharatiya, VidyaBhavan

Signature of Teacher with Date   **Signature of HOD**

Govt. Polytechnic Hamirpur (H.P.)
Lesson Planning (Practical)

Branch :Comp.Engg.   Semester : 4th

Subject : SCA   Session : Jan. 2025-Jun.2025

Teacher : Nisha kumari

S.No.	No. of Lectures	Description of Activities/Practicals	Remarks
1	4	Painting/Poster Making	
2	6	Prepare presentation on different Topics: Save Enviroment ,Global Warming ,Himachal Pradesh culture	
3	5	Sports/Cultural activity	
4	2	Quiz Competition	
5	3	Newspaper/Magazine Reading	
6	4	Campus beautification/Plantation	
7	4	Art and Carft Activity	

Signature of Teacher   **Signature of H.O.D.**