



Siliguri Institute of Technology
Department of Information Technology

Database Management Systems

PCC-CS601/ CS691



DEPARTMENT OF INFORMATION TECHNOLOGY

2022-2023

Course Description File on Database Management Systems
3rdYEAR, 6th Semester

INFORMATION TECHNOLOGY

VISION OF THE INSTITUTE:

To be a recognized institution offering high quality education, opportunities to students to become globally employable Engineers/Professionals in best ranked industries and research organization.

MISSION OF THE INSTITUTE :

To impart quality technical education for holistic development of students who will fulfill the needs of the industry/society and be actively engaged in making a successful career in industry/research/higher education in India & abroad.

VISION OF THE DEPARTMENT:

To produce competent IT professionals who will contribute towards the advancement of engineering, science and technology for the benefit of society, industry and academia.

MISSION OF THE DEPARTMENT:

To impart quality and value-based education towards achieving excellence in teaching-learning and inculcate research environment.

To produce successful graduates with professional ethics, responsibilities and commitment towards the society.

To enable graduates for providing effective solutions to real life engineering problems and thereby incorporate self-development entrepreneurship skills.

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess

societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Apply fundamental knowledge of mathematics, basic science & engineering and programming aptitude to identify and define the basic computations.

PSO2: Use of programming languages, computer organization & architecture, algorithmic principles & database for the design of computing systems in a way that demonstrates the construction of software systems of varying complexity.

PSO3: Take up higher studies and will be able to work professionally in software industries and implement projects in recent technologies.

PROGRAM EDUCATION OBJECTIVE (PEO):

The graduates of Computer Science & Engineering will:

1. Work productively as IT Engineers, including supportive and leadership roles in multidisciplinary domain with ethical values.
2. Solve real life problems as qualified professionals with a commitment towards society and environment.
3. Be adapted to new technologies with an attitude towards lifelong learning.
4. Imbibe Research and Development, and Entrepreneurships in the modern computing environment.

Course Title: Database Management Systems

Code: PCC-CS601/CS691

YEAR: 3RD

Semester: 6th SEMESTER

Name of the Faculty: Ms. Sathi Ball

Internet Homepage: <https://sites.google.com/view/profile-of-sathiball/home>

E-mail: sathiball@gmail.com

Phone No: (+91) 9433229324

Class Schedule

Dept./Day	Monday	Tuesday	Wednesday
IT	12:30 PM – 01:20 PM	10:50 AM – 11:40 AM	11:40 AM – 12:30 PM

Practical Class Schedule:

Day	Thursday
Timing	10.00am – 12.30pm (All)

Hours for meeting students: (by appointment)

Day	Tuesday	Wednesday	Thursday
Timing	3.50 pm - 4.45 pm	3.50 pm - 4.45 pm	3.50 pm - 4.45 pm

i) Course Objective

Students will be able to design normalized database and apply it to build secure and efficient applications.

ii) Course Outcomes

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes:

Cos	Outcomes	Targets
PCCCS601.1	Explain the fundamentals of DBMS and design of logical databases using design principles of ERD and relate the logic with RDBMS. [BT - Level – 2]	60%
PCCCS601.2	Identify query processing methodologies of Relational Algebra, Relational Calculus and determine the query optimization techniques.	60%

	[BT - Level – 4]	
PCCCS601.3	Construct simple and moderately advanced database queries using SQL and PL/SQL blocks for ensuring data integrity and security. [BT - Level – 6]	60%
PCCCS601.4	Design normalized database to simplify logical Structure. [BT - Level – 6]	60%
PCCCS601.5	Implement the basic issues of transaction processing, concurrency control and recovery mechanisms in applications. [BT - Level – 3]	60%

- i. Once the student has successfully completed this course, he/she must be able to answer the following questions or perform/demonstrate the following:

SN	QUESTION	BT-LEVEL
1.	What do you mean by a Database Management System?	1
2.	Explain disadvantages of a file processing system over DBMS.	2
3.	Describe 3-tire Architecture of DBMS.	2
4.	Define E-R model.	2
5.	Define PROJECTION operation.	2
6.	Write the functions of various set operations with examples.	4
7.	Explain the purpose of View in SQL.	5
8.	Describe Triggers. How are they created ?	6
9.	What is Functional Dependencies? Give examples.	2
10.	Discuss various Normal forms with example.	6
11.	What do you mean by query processing? What is a query tree?	2
12.	Explain state transition diagram.	2
13.	Construct a B+ tree with the following key : ORDER- 3, KEY = 8, 5, 1, 7, 3, 12, 9, 6.	3

iii) Topic/Unit/Chapter Layout

Chapter No.	Chapter	Lecture Hours	Tutorials	Laboratory hours
Chapter - 1	Introduction	4 HRS		
Chapter – 2	Entity-Relationship Model	6 HRS		

Chapter – 3	Relational Model	5 HRS	NOT APPLICABLE	
Chapter – 4	SQL and Integrity Constraints	8 HRS		26 HRS
Chapter – 5	Relational Database Design	9 HRS		2 HRS
Chapter – 6	Internals of RDBMS	7 HRS		
Chapter – 7	File Organization & Index Structures	6 HRS		2HRS
Total		45 HRS		30 HRS

iv) Text & Reference books

Textbooks

1. Henry F. Korth and Silberschatz Abraham, "Database System Concepts", Mc.Graw Hill.
2. Fundamentals of Database Systems", Ramez Elmasri, S hamkant B.Navathe, Addison Wesley Publishing Edition

Reference Books:

1. Ramakrishnan: Database Management System , McGraw-Hill
2. "Database Management Systems", Arun K.Majumdar, Pr itimay Bhattacharya, Tata McGraw Hill
3. James Martin, "Principles of Database Management Systems", 1985, Prentice Hall of India, New Delhi

(v) Evaluation Scheme

a) Evaluation Scheme:

1) THEORY

Evaluation Criteria	Marks
First & Second Internal Exam*	15
Quiz/ Assignments	10
Attendance	5
University Exam	70
Total	100

2) LABORATORY

Evaluation Criteria	Marks
Internal Exam*	40
University Exam	60
Total	100

a) Laboratory Evaluation:

Expt. No.	Experiment Name	Schedule	Marks																														
P1	<p>Q1. a) Create a table 'STUDENT' with following structures:-</p> <table border="1"> <thead> <tr> <th>Col. Name</th> <th>Type</th> <th>Width</th> </tr> </thead> <tbody> <tr> <td>ROLL</td> <td>NUMBER</td> <td>2</td> </tr> <tr> <td>NAME</td> <td>VARCHAR2</td> <td>15</td> </tr> <tr> <td>EXAMDATE</td> <td>DATE</td> <td></td> </tr> </tbody> </table> <p>b) Add a primary key constraint on column 'NAME'. c) Drop the primary key of the table 'STUDENT'. d) Add a primary key on col. 'ROLL' in table 'STUDENT'. e) Insert following data:-</p> <table border="1"> <thead> <tr> <th>ROLL</th> <th>NAME</th> <th>EXAMDATE</th> </tr> </thead> <tbody> <tr> <td>11</td> <td>Sourav</td> <td>01-JUN-10</td> </tr> <tr> <td>12</td> <td>Kamal</td> <td>01-JUN-10</td> </tr> <tr> <td>13</td> <td>Rahul</td> <td>01-JUN-10</td> </tr> <tr> <td>14</td> <td>Sovan</td> <td>01-DEC-10</td> </tr> <tr> <td>15</td> <td>Shyamal</td> <td>01-DEC-10</td> </tr> </tbody> </table>	Col. Name	Type	Width	ROLL	NUMBER	2	NAME	VARCHAR2	15	EXAMDATE	DATE		ROLL	NAME	EXAMDATE	11	Sourav	01-JUN-10	12	Kamal	01-JUN-10	13	Rahul	01-JUN-10	14	Sovan	01-DEC-10	15	Shyamal	01-DEC-10	1 HRS	3
Col. Name	Type	Width																															
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P2	<p>Q2. a) Create a table 'MARKS' with following structures:-</p> <table border="1"> <thead> <tr> <th>Col. Name</th> <th>Type</th> <th>Width</th> </tr> </thead> <tbody> <tr> <td>ROLL</td> <td>NUMBER</td> <td>2</td> </tr> <tr> <td>MATH</td> <td>NUMBER</td> <td>2</td> </tr> <tr> <td>ENG</td> <td>NUMBER</td> <td>3</td> </tr> </tbody> </table> <p>b) Add a foreign key constraint on column 'ROLL' in 'MARKS' table referencing column 'ROLL' in table 'STUDENT' and name the constraint as FK_ROLL. c) Change width of 'MATH' column to 3. d) Add a check constraint on 'ENG' column so that permissible value for 'ENG' attribute lies between 0 and 50 and name the constraint as CHK_ENG. e) Try to insert following data:- <11,90,80> f) Now insert following data:</p> <table border="1"> <thead> <tr> <th>ROLL</th> <th>MATH</th> <th>ENG</th> </tr> </thead> <tbody> <tr> <td>11</td> <td>90</td> <td>45</td> </tr> <tr> <td>12</td> <td>45</td> <td>46</td> </tr> <tr> <td>13</td> <td>70</td> <td>30</td> </tr> <tr> <td>14</td> <td>90</td> <td>20</td> </tr> <tr> <td>15</td> <td>45</td> <td>46</td> </tr> </tbody> </table> <p>g) Add a new column 'TOTAL' in table 'MARKS'. The data type is number and width is 3. h) Update column 'TOTAL' in 'MARKS' table with proper data.</p>	Col. Name	Type	Width	ROLL	NUMBER	2	MATH	NUMBER	2	ENG	NUMBER	3	ROLL	MATH	ENG	11	90	45	12	45	46	13	70	30	14	90	20	15	45	46	1 HRS	3
Col. Name	Type	Width																															
ROLL	NUMBER	2																															
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P3	<p>a) Display data from table 'STUDENT' with column heading ROLL_NO, STD_NAME. b) List students having name starting with letter 'S'. c) List students where second character of name is 'a'. d) Display EXAMDATE in 'DD/MM/YYYY' format. e) Display NAME, MATH, ENG and PER of all students. Assume, total marks of math are 100 and eng is 50. f) Display names of all students who are getting above 65 of math. g) Display names of students getting marks in eng between 20 and 40. h) Display name of the student, who get the same marks (math) as that of 'Shyamal'.</p>	1 HRS	3																														
P4	<p>HOTEL (HOTEL_NO, NAME, ADDRESS) ROOM(ROOM_NO, HOTEL_NO, TYPE, PRICE) BOOKING(HOTEL_NO, GUEST_NO, DATE_FROM, DATE_TO, ROOM_NO) GUEST(GUEST_NO, NAME, ADDRESS)</p> <p>Where HOTEL contains hotel details and HOTEL_NO is the Primary Key. ROOM contains room details for each hotel and (HOTEL_NO,ROOM_NO) forms the Primary key. BOOKING contains details of the bookings and the Primary Key comprises (HOTEL_NO, GUEST_NO, DATE_FORM) and GUEST contains guest details and GUEST_NO is the Primary key and mention the Foreign Key constraints.</p>	2 HRS	3																														

P5	<ul style="list-style-type: none"> i. List full details of hotels in Mumbai ii. List the name and addresses of all guests in New Delhi, alphabetically ordered by the name. iii. List all double or family rooms with a price below Rs. 800 per day, in ascending ordered. iv. List the bookings for which no date_to has been specified. v. What is the total daily revenue from all the double room? vi. How many different guests have made booking for august, 2015 vii. List the price and type of all rooms at the hotel Land Mark. viii. What is the total income from booking for the hotel Manor today. 	2 HRS	3																																																						
P6	<p>1.a) Create tables for following functional Dependencies – eno → { ename,address} pno → {pname, plocation} {eno,pno} → hours plocation must be among MUMBAI,KOLKATA,CHENNAI, and DELHI.</p> <p>b) Mention primary key, foreign key and CHECK constraints.</p> <p>c) i. Insert following data for EMP:-</p> <table border="1"> <thead> <tr> <th>ENO</th> <th>ENAME</th> <th>ADDRESS</th> </tr> </thead> <tbody> <tr><td>1</td><td>Swarnali</td><td>MUMBAI</td></tr> <tr><td>2</td><td>Deboshree</td><td>MUMBAI</td></tr> <tr><td>3</td><td>Moumita</td><td>KOLKATA</td></tr> <tr><td>4</td><td>Piyali</td><td>CHENNAI</td></tr> <tr><td>5</td><td>Surupa</td><td>DELHI</td></tr> </tbody> </table> <p>ii. Insert following data for Proj:-</p> <table border="1"> <thead> <tr> <th>PNO</th> <th>PNAME</th> <th>PLOCATION</th> </tr> </thead> <tbody> <tr><td>101</td><td>BANKING</td><td>DELHI</td></tr> <tr><td>102</td><td>LIBRARY</td><td>MUMBAI</td></tr> <tr><td>103</td><td>RAILWAY</td><td>KOLKATA</td></tr> <tr><td>104</td><td>FINANCE</td><td>CHENNAI</td></tr> <tr><td>105</td><td>ANALYZER</td><td>DELHI</td></tr> </tbody> </table> <p>iii. Insert following data for EmpProj:-</p> <table border="1"> <thead> <tr> <th>ENO</th> <th>PNNO</th> <th>HOURS</th> </tr> </thead> <tbody> <tr><td>1</td><td>101</td><td>10</td></tr> <tr><td>2</td><td>103</td><td>12</td></tr> <tr><td>3</td><td>104</td><td>19</td></tr> <tr><td>3</td><td>105</td><td>29</td></tr> <tr><td>5</td><td>102</td><td>6</td></tr> </tbody> </table> <p>d) List the name of employees who are working on more than one project</p>	ENO	ENAME	ADDRESS	1	Swarnali	MUMBAI	2	Deboshree	MUMBAI	3	Moumita	KOLKATA	4	Piyali	CHENNAI	5	Surupa	DELHI	PNO	PNAME	PLOCATION	101	BANKING	DELHI	102	LIBRARY	MUMBAI	103	RAILWAY	KOLKATA	104	FINANCE	CHENNAI	105	ANALYZER	DELHI	ENO	PNNO	HOURS	1	101	10	2	103	12	3	104	19	3	105	29	5	102	6	3 HRS	3
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5	102	6																																																							
P7	<p>2.a) Create a table PHONE_BOOK. The fields of the table are NAME, ADDRESS, PHONE_NO.</p> <p>b) Insert at least 6 entries into the table of which there are two pairs of duplicate entries.</p> <p>c) Delete duplicate rows from the table.</p> <p>d) Write a query to select first two rows from the table.</p> <p>e) Write a query to select last two rows from the table.</p>	3 HRS	3																																																						
P8	<p>3.a) Create a table employee and insert following data into the table.</p> <table border="1"> <thead> <tr> <th>EMPNO</th> <th>EMPNAME</th> <th>MANAGERNO</th> <th>SALARY</th> </tr> </thead> <tbody> <tr><td>E1</td><td>Amal</td><td>--</td><td>30,000</td></tr> <tr><td>E2</td><td>Bimal</td><td>E1</td><td>25,000</td></tr> <tr><td>E3</td><td>Kamal</td><td>E1</td><td>20,000</td></tr> <tr><td>E4</td><td>Nirmal</td><td>E2</td><td>15,000</td></tr> <tr><td>E5</td><td>Shymal</td><td>E2</td><td>21,000</td></tr> <tr><td>E6</td><td>Parimal</td><td>E3</td><td>10,000</td></tr> </tbody> </table> <p>b) Retrieve the names of the employees and the names of their respective managers from the employee table.</p> <p>c) Retrieve the name of the employee who is earning second maximum salary.</p> <p>d) Retrieve the name of the employee who is earning nth highest salary.</p> <p>e) Retrieve the names of employees whose salary is greater than the salary of all the employees whose manager no. is E1.</p> <p>f) Get the details of all employees whose salary is lesser than the average salary of the employee.</p>	EMPNO	EMPNAME	MANAGERNO	SALARY	E1	Amal	--	30,000	E2	Bimal	E1	25,000	E3	Kamal	E1	20,000	E4	Nirmal	E2	15,000	E5	Shymal	E2	21,000	E6	Parimal	E3	10,000	4 HRS	3																										
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	<p>f. Insert 3 records. Try different DML operations.</p> <p>10.a. Log in as IT (User ID: IT, Password: IT). Display all records from the Employee table of the user Student. Try to insert or update any record. Note down the error.</p> <p>b. Grant the object privileges on the table STUDENT.EMPLOYEE to IT with without Grant option.</p> <p>c. Now do the experiments given in 2a.</p> <p>d. Log in as IT. Try to grant the object Privilege on STUDENT.EMPLOYEE to the user IT. Note down the error. How this can possible.</p>		
P11	<p>Write a PL/SQL program to check the given number is even or odd.</p> <p>Write a program to check whether a given number is prime or not.</p> <p>Write a PL/SQL program to check whether a number is Armstrong number or not.</p>	7 HRS	3
P12	<p>a) Write a procedure to calculate sum of two numbers.</p> <p>b) Write a PL/SQL function, which returns maximum of the three numbers.</p> <p>c) Write a function, which returns true if employee exist in employee table, otherwise it returns false.</p> <p>The Table is as follows: EMPLOYEE (ENO, ENAME, SALARY, MGRNO)</p>	8 HRS	3
P13	<p>a) Write a PL/SQL code block to calculate the area of a circle for a value of radius varying from 3 to 7. Store the radius and the corresponding values of calculated areas in table.</p> <p>b) Add an extra column diameter to the table circle and update the diameter column for each entry diameter=2* radius.</p> <p>c) Print the number of records in the circle table with the help of an explicit cursor.</p> <p>a)A HRD manager has decided to raise the salary for all the employees in department number 20 by 0.05. Whenever any such raise is given to employees an audit trail of the same is maintained in the EMP_RAISE table. The EMP_RAISE table holds the employee number, the date when the raise was given and the raise amount.</p> <p>b) Write a PL/SQL block to update the salary of each employee of dept-no 20 appropriately and insert a record in the EMP_RAISE table as well.</p> <p>Tables are as follows: EMPLOYEE (EMP_CODE, ENAME, JOB, SALARY, DEPTNO) EMP_RAISE(EMP_CODE, RAISE_AMOUNT, RAISE_DATE)</p>	9 HRS	3
P14	<p>Create a transparent audit system for a table CLIENT_MASTER. The system must keep track of the records that are being deleted or updated. The functionality being when a record is deleted or modified the original record details and the date of operations is stored in the audit-client table, the delete or update is allowed to go through.</p> <p>Write a trigger for the above problem.</p> <p>The Tables are as follows:- CLIENT_MASTER(CLIENT_NO, NAME, ADDRESS, CITY, BAL-DUE) AUDIT_CLIENT(CLIENT_NO, NAME, BAL_DUE, OPERATION, USER_ID, OP_DATE)</p>	10 HRS	3
Total			40
University Exams			60

* The Internal assessment will be determined through the continuous assessment (CA) which is needed to be submitted 4 times in a semester based on performance of the students assessed as per academic calendar published by the University. The 4 no's of CAs will be based on test/ viva/ quiz/ presentation/seminar/ GD etc. out of which 2 no's preferably would be tests.

Assignments will be given in all of the following forms

1. Problem Solving—Numeric and conceptual

2. Term paper – A systematic report on a topic to be submitted under supervision after doing necessary exploration of knowledge on the topic.

3. Mini project – A small project on the topic or problem assigned by the teacher and covered by the course being taught. The duration of the project will be not more than one month.

4. Presentation & Seminar – The student will prepare a PPT on a topic relevant to the course and present with PPT for 10 minutes under supervision

Schedule for Continuous Assessment (CA):

CA Description	Schedule
Quiz – 1	As per Institute Academic Calendar
1 st Internal Examination	
Term Paper	
Quiz – 2	
Assignment	
2 nd Internal Examination	

Course target attainment levels:

Attainment Level	Inference	Marks
Attainment Level 1	50% of the students have attained more than the target level of that CO	1
Attainment Level 2	60% of the students have attained more than the target level of that CO	2
Attainment Level 3	70% of the students have attained more than the target level of that CO	3

Course Target for the university examination = 60% of the students will get “A” Grade

Target has been set on the basis of last year’s performance / result by the students, student quality this year and difficulty level of the course.

University Grading System:

Grade	Marks
O	90% and above
E	80 – 89.9%
A	70 – 79.9%
B	60 – 69.9%
C	50 – 59.9%
D	40 – 49.9%
F	Below 40%

(vi) Mapping of Course Outcomes and Program Outcomes:

Course Outcomes	Program Outcomes												PSOs		
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	1.	2.	3.
PCC-CS601.1	1	1	1	--	--	--	--	--	--	--	--	--	1	--	--
PCC – CS601.2	2	2	1	1	--	--	--	--	--	--	--	--	1	--	--
PCC – CS601.3	2	2	2	1	1	--	--	--	1	--	--	1	1	2	3
PCC – CS601.4	2	2	2	--	--	--	--	--	--	--	--	--	1	--	--
PCC – CS601.5	2	2	1	1	--	--	--	--	--	--	--	--	1	--	--
PCC-CS601	2	2	1	1	1	--	--	--	1	--	--	1	1	2	3

Justification :

- CO1 to CO5 satisfies knowledge of mathematics and science in solving engineering problems and development / design solution of complex engineering problem. (PO1, PO2, PO3).
- CO2, CO3, CO5 knowledge help to do investigation of complex problems in research based work.(PO4)
- CO3, CO5 minimally satisfies modern engineering and IT tools. (PO5).
- CO3 minimally satisfies the individual and team work. (PO9).
- CO1 to CO5 minimally satisfies the lifelong learning. (PO12).

FOR PSO

- CO1 to CO5 satisfies application of knowledge of mathematical foundations, programming skills and algorithm etc. (PSO1).
- CO3 minimally satisfies. (PSO2).

(vii) Assessment Methodology

Outcome	Assessment Tool
PCC-CS601.1	Internal Test, Quiz, University Exam, Term Paper, PPT Presentation
PCC-CS601.2	
PCC-CS601.3	
PCC-CS601.4	
PCC-CS601.5	

(VIII)Weekly Lesson Plan

Sl. No.	CO (Mention Number)	Topic (s) (Details as specified in syllabus)	Book No [CH No], [Page No]	Teaching-Learning Methods	Plan Date
1	1	Overview of DBMS: Definition, Application, File & Database Concepts, 3 Schema architecture, Data Abstraction, Data Independence, Database Users, Database Administrator, Concepts of Instances and Schemas, Metadata, Data Dictionary, Data Models	Database System Concepts Ch-[1] Class Notes	T: Chalk & Talk L: Observes understands	09.01.23 to 11.01.23
2	1	ERD: Basic concepts, Degree and Cardinality of relationship, Types of attributes, Mapping Cardinalities, Keys, Weak Entity sets, Participation constraints, Specialization and Generalization and the Constraints on them, Aggregation	Database System Concepts Ch-[2] Class Notes	T: Chalk & Talk L: Observes understands	16.01.23 to 18.01.23
3	1	Design of RDBMS from ERD	Database System Concepts Ch-[2] Class Notes	T: Chalk & Talk L: Observes understands	24.01.23
4	3	Integrity Constraints,	Database System Concepts Ch-[6] Class Notes	T: Chalk & Talk L: Observes understands	01.02.23 & 06.02.23
5	2	Relational Algebra Operations: select, project, Cartesian product, union, intersect, set difference, Join: inner join, outer join, assignment, Rename, Division, Generalized projection, Aggregate functions, Modifications of database: insert, update, delete	Database System Concepts Ch-[3] Fundamentals of Database Systems Ch-[6] Class Notes	T: Chalk & Talk Questioning /Discussion L: Answering questions, Participates	07.02.23, 08.02.23, 13.02.23
6	2	Relational Calculus: Tuple Relational Calculus, Domain Relational Calculus	Database System Concepts Ch-[3]	T: Chalk & Talk, Questioning /Discussion L: Observes understands, Answering questions, Participates	14.02.23 to 15.03.23
7	3	SQL: Data Languages-Procedural & Non-Procedural, Basic SQL commands, Constraints, Aggregate Functions, Nested sub queries using Comparison operators	Database System Concepts Ch-[4] Fundamentals of Database Systems Ch-[8, 9] PL/SQL by Ivan Bayross Class Notes	T: Chalk & Talk Questioning /Discussion L: Answering questions, Participates	20.02.23 to 22.02.23 & LAB Session
8	3	SQL3, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQLserver. Open source and Commercial DBMS -	PL/SQL by Ivan Bayross, Downloaded	T: Chalk & Talk Questioning /Discussion L: Answering	27.02.23 to 01.03.23 & LAB Session

		MYSQL, ORACLE, DB2, SQLserver.	Content from Internet Class Notes	questions, Participates	
9	4	FDs, Armstrong's axioms, Closure of FDs, Attribute closure, Minimal Cover	Database System Concepts Ch-[7] Fundamentals of Database Systems Ch-[10] Class Notes	T: Chalk & Talk Questioning /Discussion L: Answering questions, Participates	13.03.23 to 15.03.23
10	4	Database Normalization: 1NF, 2NF, 3NF, BCNF, MVD & 4NF, JD & 5NF, Dependency Preservation Property and Lossless Join Decomposition	Database System Concepts Ch-[7] Fundamentals of Database Systems Ch-[10] Class Notes	T: Chalk & Talk, Questioning /Discussion L: Observes understands, Answering questions, Participates	20.03.23 to 22.03.23
11	5	Transaction properties, states, operations, Schedule, Serializability, Test for Conflict serializability, Recoverable schedule, Cascade less schedule, View serializability,	Database System Concepts Ch-[15] Fundamentals of Database Systems Ch-[17] Class Notes	T: Chalk & Talk, Questioning /Discussion L: Observes understands, Answering questions, Participates	27.03.23 to 29.03.23
12	5	Concurrency Control: Need, Techniques: Locks, 2PL, Deadlock, Time Stamp Protocol	Database System Concepts Ch-[16] Fundamentals of Database Systems Ch-[18] Class Notes	T: Chalk & Talk Questioning /Discussion L: Answering questions, Participates	03.04.23 to 05.04.23
13	5	Log based Recovery Techniques, Check Points, Non-log-based Recovery Techniques	Database System Concepts Ch-[17] Fundamentals of Database Systems Ch-[19] Class Notes	T: Chalk & Talk L: Observes understands	10.04.23 to 12.04.23
14	2	Query Optimization Steps, Operator Tree Construction	Database System Concepts Ch-[13, 14] Fundamentals of Database Systems Ch-[15] Class Notes	T: Chalk & Talk, Questioning /Discussion L: Observes understands, Answering questions, Participates	17.04.23 to 19.04.23
15	4	Indexing Techniques: Primary, Clustered, Secondary Multilevel Index, B Tree, B+ Tree: Construction, Insertion, Deletion	Database System Concepts Ch-[12] Fundamentals of Database Systems Ch-[14] Class Notes	T: Chalk & Talk, Questioning /Discussion L: Observes understands, Answering questions, Participates	24.04.23 to 26.04.23
16	3	Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection. Intrusion detection, SQL	Class Notes	T: Chalk & Talk L: Observes understands	01.05.23 to 03.05.23

		injection.			
17	3	Object oriented and object relational databases, Logical databases, Web databases, Distributed databases, Data warehousing and data mining. Distributed databases, Data warehousing and data mining.	Fundamentals of Database Systems Ch-[20, 27, 28] Class Notes	T: Chalk & Talk L: Observes understands	08.05.23 to 10.05.23

Name and Signature of the Teacher

Name and Signature of the HoD