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Lesson Plan

Lesson Plan No. 1	Course Name: Database Management System Topic: File based systems	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to:
	    a. Understand the concept of File based system
	    b. Learn about its working & its drawbacks

Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	    - How do you store files on computers?
	    - Give few examples of file based systems?
	
	- **Development** (30 minutes)
	- Definition/Introduction of file based system
	- Explain with examples
	- Discuss the advantages & disadvantages of File based system
	
	- **Exercise** (10 minutes) –
	- Group Discussion at the end of the session.
	- Ask students to define File based systems & its drawbacks
	
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	
	2. Suggested NPTEL video lecture
	https://www.youtube.com/watch?v=8e-wgQnsFxE&t=209s
	
	Reference website:
	https://www.javatpoint.com/dbms-vs-files-system
	
	Suggested Reading books:
	- Database System Concepts by Korth, Silberchatz.
	- Fundamentals of Database System by lmasriRame,Navathe Shamkant
	
	3. Homework
	    • What is the role of the file system in a DBMS?.
	    • Explain the concept of File based systems
	    • Discuss its working of File Based systems with examples
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to

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	answer and discuss. 2. Quiz on File based systems Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 2	Course Name: Database Management System Topic: Introduction to DBMS	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Database Management systems b. Learn about its working & its significance
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	- Begin by discussing the importance of data in today's world and how it drives decision-making.
	- Highlight the challenges of managing large volumes of data using traditional file systems.
	- Introduce the concept of a Database Management System (DBMS) as a solution to these challenges.
	
	- **Development** (30 minutes)
	Explain :
	    - How do you store files on computers?
	    - Give few examples of file based systems?
	    - What are the limitations of File based systems?
	- Definition/Introduction of Database Management systems
	- Need of DBMS
	- Explain with examples
	- Discuss the features of Database Management systems
	
	- **Exercise** (10 minutes) –
	- Group Discussion at the end of the session.
	- Ask students to define Database Management systems & its importance
	
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=8e-wgQnsFxE&t=209s 3. Reference website: https://www.tutorialspoint.com/dbms/dbms_overview.htm Suggested Reading books: - Database System Concepts by Korth, Silberchatz.

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	- Fundamentals of Database System by lmasriRame,Navathe Shamkant
	
	4. Homework
	    - Explain the concept of Database Management systems
	    - What were the limitations of File systems
	    - What is the need of DBMS
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on fundamentals of DBMS Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 3	Course Name: Database Management System Topic: Components of Database Management systems	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the various components of Database Management systems b. Learn about role of each component of DBMS
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	 - Ask questions.
	   - Begin by asking students what they understand by a database.
	   - Define a DBMS as a software system that manages databases.
	   - Explain the importance of DBMS in today's world
	 - **Development** (30 minutes)
	   Definition/Introduction of components of DBMS
	 - Role of each component
	 - Users
	 - Software
	 - Hardware
	 - Data
	 - Procedures
	
	 - **Exercise** (10 minutes) –
	   - Group Discussion at the end of the session.
	   - Ask students to define Database Management systems & discuss its components
	
	 Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=EUzsy3W4I0g 3. Reference website: https://www.javatpoint.com/components-of-dbms Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by lmasriRame,Navathe Shamkant

	4. Homework
	    - What is the fundamental unit of information stored in a DBMS?
	    - Explain the various components of Database Management systems
	    - Discuss the various users associated with DBMS
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on components of Database Management systems Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 4	Course Name: Database Management System Topic: Data Independence	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to:
	  a. Understand the concept of Data Independence
	  b. Learn about role of each level/schema

Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	  - Begin by discussing the importance of data in modern organizations.
	  - Highlight the need for efficient and flexible data management.
	  - Introduce the concept of a Database Management System (DBMS)
	  - How many users are connected with DBMS?
	  - Do all the users have the same accessibility?
	
	- **Development** (30 minutes)
	  - Definition/Introduction of Data independence
	  - Role of each level
	    - Logical
	    - Physical
	    - View
	  - Explanation through block diagram of data Independence.
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to explain the concept of Data Independence
	
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=AAKUqHBuzk4&t=1188s 3. Reference website: https://www.geeksforgeeks.org/what-is-data-independence-in-dbms/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by lmasriRame,Navathe

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	4. Homework
	   - Why is data independence important in DBMS? How does it benefit users and developers?
	   - Define data independence. What are its two main types?
	   - What is the difference between logical and physical data independence? Provide examples of each.
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on data independence Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 5	Course Name: Database Management System Topic: Models in DBMS	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to:
	   a. Enlist the various data models in Database Management systems
	   b. Learn about the role of each data model

Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	- How is the data related to each other?
	- How is the relationship among data entities expressed?
	- Begin by defining the term "data model." Explain how data models provide a blueprint for organizing and managing data.
	- Discuss the importance of data models in database design and development.
	- Introduce the three levels of data modeling: conceptual, logical, and physical
	
	- **Development** (30 minutes)
	- Definition/Introduction of Data models in Database Management systems
	- Role of each model
	   - Hierarchical Data model
	   - Relational Data model
	   - Network Data model
	- Advantage and disadvantage of each type
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to enlist various Models
	  - Discuss about each data model.
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=sEaYXwmsLw0&t=2126s 3. Reference website: https://www.geeksforgeeks.org/data-models-in-dbms/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz.

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	- Fundamentals of Database System by lmasriRame,Navathe Shamkant 4. Homework - What is a data model? How does it help in database design? - What is the relational model? How does it represent data? - What are the advantages and disadvantages of the ER model and the relational model? - Explain the various data model in Database Management systems with schematic diagram Spend 5 minutes to wrap up and consolidate the learnings	
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on Models of Database Management systems Spend 5 minutes to evaluate student assimilation of the lesson contents	

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Lesson Plan No. 6	Course Name: Database Management System Topic: Architecture in DBMS	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the architecture of DBMS b. Learn about role of each type of architecture.
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	- How many users relate to DBMS?
	- Define the term "DBMS" and its purpose.
	- Discuss the importance of understanding DBMS architecture.
	- Introduce the different levels of DBMS architecture: physical, conceptual, and external.
	- **Development** (30 minutes)
	- Definition/Introduction of Architecture of DBMS
	- Role of each layer
	   - 1- tier
	   - 2- tier
	   - 3- tier
	- Explanation through block diagram of each type.
	- Advantage & disadvantages of each
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to enlist various Models
	  - Discuss about each data model.
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=AAKUqHBuzk4&t=1188s 3. Reference website: https://www.javatpoint.com/dbms-architecture Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant 4. Homework

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	- What are the three levels of DBMS architecture? Explain their purpose. - How does the client-server architecture work in a DBMS, and what are its key advantages? - How does the DBMS ensure data security and integrity at each level of its architecture? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on architecture of DBMS Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 7	Course Name: Database Management System Topic: File organization in DBMS	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Enlist the various File organization in Database Management systems b. Learn about the role of each file organization
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	 - Ask questions.
	 - How are the records in Database related to each other?
	 - How is the relationship among data entities expressed?
	 - **Development** (30 minutes)
	 - Definition/Introduction of File organization in Database Management systems
	 - Role of each File organization
	      - Sequential
	      - Indexed Sequential
	      - Direct Access
	 - Advantage and disadvantage of each type
	
	 - **Exercise** (10 minutes) –
	   - Group Discussion at the end of the session.
	      - Ask students to enlist various File organisations
	      - Discuss about each File organisation.
	 Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=3l-hYcZgNYI&list=PLyqSpQzTE6M-xymXgqewlzcC3U4cdRoSu&index=28 3. Reference website: https://www.geeksforgeeks.org/file-organization-in-dbms-set-1/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant 4. Homework

	- What is File Organization? What are the four methods of file organization? - What is the difference between Sequential File Organization and Heap File Organization? - What is the advantage of using Hash File Organization? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on File Organization in DBMS Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 8	Course Name: Database Management System Topic: ER model in DBMS	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of ER model b. Learn about the significance of ER models in DBMS c. Construct ER model for a given data
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	- How are the records in Database related to each other?
	- How is the relationship among data entities expressed?
	
	- **Development** (30 minutes)
	  - Definition/Introduction of ER model
	  - Discussion on important terms
	    - Entity
	    - Attributes
	    - Relationship
	  - Construction of ER diagram by taking few examples
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Discuss about ER model and its important terms.
	
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://nptel.ac.in/courses/106/106/106106093/ 3. Reference website: https://www.geeksforgeeks.org/introduction-of-er-model/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant 4. Homework - Create an ER diagram for a library database that includes books, authors, borrowers, and loans. - Design an ER diagram for a university database that includes

	students, courses, professors, and departments. - Consider a company database. Identify the entities and relationships involved, and create an ER diagram Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on ER models in DBMS Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 9	Course Name: Database Management System Topic: ER model to relational table	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to:
	  a. Understand the method of conversion of ER model to relational table
	  b. Learn about the different rules used in conversion.

Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	  - What do you understand by ER model?
	  - What is a relation table?
	  - Discuss what is strong and weak entity.
	
	- **Development** (30 minutes)
	  - Definition/Introduction of rules of conversion
	  - Discussion on each rule:
	    - Strong Entity set with Simple attributes
	    - Strong Entity Set with Composite Attributes
	    - Strong Entity Set with Multi Valued Attributes
	    - Relationship Set to a Table conversion
	    - Binary relationship with cardinality
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to explain all the rules used in conversion
	
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	
	2. Suggested NPTEL video lecture
	https://www.youtube.com/watch?v=qRqzmAwmJwY
	
	3. Reference website:
	https://www.gatevidyalay.com/er-diagrams-to-tables/
	
	Suggested Reading books:
	  - Database System Concepts by Korth, Silberchatz.
	  - Fundamentals of Database System by ElmasriRame, Navathe Shamkant
	
	4. Homework
	  - How do you convert a 1:1 relationship into relational tables?

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	- How do you convert a 1:M relationship into relational tables? - How do you convert an M:N relationship into relational tables? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on rules of conversion Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 10	Course Name: Database Management System Topic: Joins	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Join operation b. Learn about its different types.
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	 - Ask questions.
	 - What do you understand by cartesian product?
	 - Explain the purpose of JOIN operations: to combine data from multiple tables based on related columns.
	 - Discuss the importance of relationships between tables (primary and foreign keys)..
	
	 - **Development** (30 minutes)
	   - Definition/Introduction of Join operation
	   - Discussion on each type:
	   - Inner Join:
	     - Theta Join,
	     - Natural Join
	   - Outer Join:
	     - left,
	     - right,
	     - Full.
	
	 - **Exercise** (10 minutes) –
	 - Group Discussion at the end of the session.
	 - Ask students to explain the operation used in Join of tables
	
	 Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=qRqzmAwmJwY 3. Reference website: https://www.guru99.com/joins-sql-left-right.html Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe

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	4. Homework
	  - What are the different types of JOINs?
	  - Explain the difference between a LEFT OUTER JOIN and a RIGHT OUTER JOIN.
	  - Define Join operation and explain its types with examples
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on Join operation Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 11	Course Name: Database Management System Topic: Relational Algebra	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to:
	  a. Understand the concept of Relational Algebra
	  b. Learn about its different operations

Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	- What do you understand by unary operators?
	- Explain the meaning of Binary operator?
	
	- **Development** (30 minutes)
	- Definition/Introduction of Relational algebra
	- Discussion on each operation:
	     - Select
	     - Project
	     - Union
	     - Intersection
	     - Difference
	     - Cartesian product
	     - Rename
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	     - Ask students to explain the operations used in relational algebra
	
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=qRqzmAwmJwY 3. Reference website: https://www.geeksforgeeks.org/introduction-of-relational-algebra-in-dbms/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant

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	4. Homework
	  - What is relational algebra?
	  - What are the basic relational algebra operators?
	  - Explain the difference between selection and projection.
	  - How does the Cartesian product work?
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on relational algebra Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 12	Course Name: Database Management System Topic: Relational Calculus	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Relational Calculus b. Draw comparison between Tuple & Domain Relational Calculus
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	- What is relational algebra?
	- What do you understand by unary operators?
	- Explain the meaning of Binary operator?
	
	- **Development** (30 minutes)
	  - Definition/Introduction of Relational Calculus
	  - Discussion on each type:
	    - Tuple Relational Calculus
	    - Domain Relational Calculus
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to to explain the types of Relational Calculus
	
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=V2iBuOtX458 3. Reference website: https://www.javatpoint.com/dbms-relational-calculus Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant 4. Homework -What is relational calculus? -What are the two main types of relational calculus? -How does relational calculus differ from relational algebra? -What is the role of range variables in tuple relational calculus?

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	Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on relational calculus Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 13	Course Name: Database Management System Topic: Keys	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of keys in DBMS b. Explain the different types of keys and their role in databases.
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	 - Ask questions.
	    - What is a table?
	    - Define tuple & attributes
	 - **Development** (30 minutes)
	    - 1. **Introduction to Keys**
	
	    - Define the concept of a key in a database.
	    - Explain the role of keys in ensuring data integrity and uniqueness.
	
	    - 2. **Primary Keys**
	    - Define a primary key and its characteristics.
	    - Discuss the importance of primary keys in identifying unique rows.
	
	    - 3. **Candidate Keys**
	    -
	    - Define a candidate key and its relationship to a primary key.
	    - Explain how to identify candidate keys in a given schema.
	
	    - 4. **Superkeys**
	    -
	    - Define a superkey and its relationship to candidate keys.
	    - Explain how superkeys can be used to identify potential primary keys.
	
	    - 5. **Foreign Keys**
	    -
	    - Define a foreign key and its role in establishing relationships between tables.
	
	 - **Exercise** (10 minutes) –

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	- Group Discussion at the end of the session. - Ask students to to explain the explain the role of each key in Database Question and Answer session in between the lesson to check the presence of mind of students.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=V2iBuOtX458 3. Reference website: https://www.javatpoint.com/dbms-keys Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant 4. Homework -What is a key in a database? -What are the different types of keys in a database? -What is the role of a primary key in a table? -What is a candidate key? -How is a superkey related to a candidate key? -What is a foreign key and how is it used? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on key in a database Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 14	Course Name: Database Management System Topic: Canonical Cover	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Canonical Cover in DBMS b. Articulate its significance in Functional dependency c. Learn about the steps of finding Canonical Cover.
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	 - Ask questions.
	   - Basic understanding of relational databases and their structure.
	   - Familiarity with the concept of functional dependencies.
	
	 - **Development** (30 minutes)
	   - Definition/Introduction of Canonical Cover
	   - Significance of Canonical Cover
	   - Characteristics of Canonical Cover
	   - Few examples
	   - Steps to find Canonical Cover
	
	 - **Exercise** (10 minutes) –
	   - Group Discussion at the end of the session.
	   - Ask students to explain the significance of canonical cover in functional dependency.
	
	 Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=YD8dhOmuVnY 3. Reference website: https://www.geeksforgeeks.org/canonical-cover-of-functional-dependencies-in-dbms/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant 4. Homework - Define canonical cover and explain the steps for finding canonical cover

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	- What is the purpose of finding a canonical cover for a set of functional dependencies (FDs)? - How does a canonical cover differ from a minimal cover? - What are the properties of a canonical cover? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on canonical cover in a database Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 15	Course Name: Database Management System Topic: closure	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of closure in database systems. b. Compute the closure of an attribute set under a given set of functional dependencies (FDs). c. Apply the concept of closure to database design and normalization.
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	
	    Prerequisites:
	  - Basic understanding of database concepts and relational algebra.
	  - Familiarity with functional dependencies
	- **Development** (30 minutes)
	  - Definition/Introduction of closure
	  - Significance of closure
	  - Characteristics of closure
	  - Few examples
	  - Steps to find closure
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to explain the significance of closure in functional dependency.
	
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=YD8dhOmuVnY 3. Reference website: https://www.tutorialspoint.com/explain-closure-of-attributes-in-dbms Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant

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	4. Homework
	
	  - How is the closure of an attribute set used in database design?
	  - How can the closure be used to identify candidate keys?
	  - What is the relationship between the closure of an attribute set and the concept of normalization?
	  - Can you provide an example of how the closure of an attribute set is used in database design?
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on closure in a database Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 16	Course Name: Database Management System Topic: Functional Dependency	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Functional dependency in DBMS b. Explain the different types of Functional dependency and their role in databases.
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	 - Ask questions.
	
	    - What is an attribute?
	    - What is a table?
	    - Define primary key and non-key attribute?
	
	 - **Development** (30 minutes)
	 -Definition/Introduction of keys
	 -Discussion on each of these:
	     -Trivial Functional dependency
	     -Non-Trivial Functional dependency
	     -Multivalued Functional dependency
	     -Transitive Functional dependency
	     -Practice questions on each FD type
	
	 - **Exercise** (10 minutes) –
	    - Group Discussion at the end of the session.
	    - Ask students to explain the role of each Functional dependency in Database
	
	 Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=YD8dhOmuVnY 3. Reference website: https://www.geeksforgeeks.org/types-of-functional-dependencies-in-dbms/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant

	4. Homework - What is a functional dependency (FD)? - How is an FD represented? - What does it mean for an attribute set to functionally determine another attribute set? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on functional dependency in a database Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 17	Course Name: Database Management System Topic: Inference Rule	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to:
	  a. Understand the concept of Inference Rules in DBMS
	  b. Explain the different Inference rules and their role in relational databases.

Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	  - Begin with a captivating logical puzzle or riddle related to databases.
	  - Definition: Introduce the concept of inference rules as tools used to deduce implicit relationships between attributes in a database schema.
	  - Importance: Explain the significance of inference rules in database design, normalization, and query optimization.
	- **Development** (30 minutes)
	  -Definition/Introduction of Inference rules
	  -Discussion on each of these:
	    - Reflexive
	    - Augmentation
	    - Transitive
	    - Union
	    - Decomposition
	    - Pseudo transitive
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to explain the role of each Inference rule in Database
	
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	
	2. Suggested NPTEL video lecture
	  https://nptel.ac.in/courses/106/106/106106220/
	  https://nptel.ac.in/courses/106/106/106106093/
	
	3. Reference website:
	  https://www.javatpoint.com/dbms-inference-rule
	
	Suggested Reading books:

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	- Database System Concepts by Korth, Silberchatz.
	- Fundamentals of Database System by ElmasriRame, Navathe Shamkant
	
	4. Homework
	
	  - What is an inference rule in DBMS?
	  - What are Armstrong's axioms?
	  - How do inference rules help in database design?
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on inference rule in DBMS Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 18	Course Name: Database Management System Topic: Normalization	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Normalization in DBMS b. Articulate significance of Normalization c. Learn about the different normal forms
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	- What do you understand by redundancy?
	- Begin with a real-world example of a database that is not normalized to illustrate the potential problems.
	- Introduce the concept of normalization as a process of organizing data into tables to minimize redundancy and ensure data integrity.
	
	- **Development** (30 minutes)
	- Definition/Introduction of Normalisation
	- Significance of Normalisation in Databases
	- Discussion on different normal forms
	
	- **First Normal Form (1NF)**
	  - Definition: Explain that a relation is in 1NF if all its attributes are atomic.
	  - Examples: Provide examples of relations that are and are not in 1NF.
	  - Normalization: Demonstrate how to convert a relation into 1NF by decomposing non-atomic attributes.
	
	Second Normal Form (2NF)
	  - Definition: Explain that a relation is in 2NF if it is in 1NF and all non-key attributes are fully dependent on the primary key.
	  - Transitive Dependencies: Discuss transitive dependencies and their impact on data redundancy.
	  - Normalization: Demonstrate how to normalize a relation into 2NF by decomposing relations with transitive dependencies.
	
	Third Normal Form (3NF)
	  - Definition: Explain that a relation is in 3NF if it is in 2NF and there are no transitive dependencies between non-key attributes.
	  - Normalization: Demonstrate how to normalize a relation into 3NF by decomposing relations with transitive dependencies between non-key attributes.

		Boyce-Codd Normal Form (BCNF)
		- Definition: Explain that a relation is in BCNF if every determinant is a superkey.
		- Comparison to 3NF: Compare BCNF to 3NF and discuss the advantages of BCNF.
		- Normalization: Demonstrate how to normalize a relation into BCNF.
		- **Exercise** (10 minutes) –
		- Group Discussion at the end of the session.
		- Ask students to explain the role of each Inference rule in Database
		Question and Answer session in between the lesson to check the presence of mind of students.
Closure		1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
		2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=YD8dhOmuVnY
		3. Reference website: https://www.javatpoint.com/dbms-normalization
		Suggested Reading books:
		- Database System Concepts by Korth, Silberchatz.
		- Fundamentals of Database System by ElmasriRame, Navathe Shamkant
		4. Homework
		- What is normalization in DBMS?
		- Why is normalization important in database design?
		- What are the different normal forms?
		- How does normalization help to prevent data anomalies?
		Spend 5 minutes to wrap up and consolidate the learnings
Evaluation		1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.
		2. Quiz on normalization in DBMS
		Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 19	Course Name: Database Management System Topic: Concurrency Control	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of concurrency in DBMS b. Learn and analyze the three problems that occur with the concurrent execution of the operations
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	 - Ask questions.
	
	 - Begin with a real-world example of a database application where concurrent access is critical (e.g., online banking, airline reservations).
	 - Definition: Introduce the concept of concurrency control as the process of managing simultaneous access to a database to ensure data consistency and integrity.
	
	 - **Development** (30 minutes)
	 - Definition/Introduction of concurrency
	 - Discussion on problems that occur during concurrent transaction:
	   - Problem 1: Lost Update Problems (W - W Conflict)
	   - Problem 2: Dirty Read Problems (W-R Conflict)
	   - Problem 3: Unrepeatable Read Problem (W-R Conflict)
	 - Explanation with examples
	
	 - **Exercise** (10 minutes) –
	 - Group Discussion at the end of the session.
	 - Ask students to explain the three problems that occur during concurrent transactions
	 Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=abLIS6BX964 3. Reference website: https://www.geeksforgeeks.org/concurrency-control-in-dbms/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe

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	4. Homework
	
	   - Define concurrency and explain the three problems.
	   - How can you choose the appropriate concurrency control technique for a given database application?
	   - What are the main goals of concurrency control?
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on concurrency in DBMS Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 20	Course Name: Database Management System Topic: Concurrency Control Protocols	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Concurrency Control protocols in DBMS b. Learn about various locking techniques
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	
	- What do you understand by concurrent transaction?
	- Explain the two operations in transaction.
	
	- **Development** (30 minutes)
	- Definition/Introduction of concurrency control protocols
	- Types of locking techniques:
	  - Lock Based Protocols
	  - Two Phase Locking
	- Explanation with examples
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to explain the Concurrency Control protocols
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture http://www.digimat.in/nptel/courses/video/106104135/L39.html 3. Reference website: https://www.geeksforgeeks.org/lock-based-concurrency-control-protocol-in-dbms/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant 4. Homework - Define concurrency and explain the three problems. - How can you choose the appropriate concurrency control technique

	for a given database application? - What are the main goals of concurrency control? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on concurrency control protocol Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 21	Course Name: Database Management System Topic: Time Stamp Ordering Protocol	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Timestamp ordering protocols b. Learn about working of Timestamp ordering protocols
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	 - Ask questions.
	
	 - Begin with a real-world example of a database application where concurrency control is critical (e.g., online banking, airline reservations).
	 - Definition: Introduce the concept of timestamp ordering protocol as a concurrency control technique that uses timestamps to order transactions and prevent conflicts.
	
	 - **Development** (30 minutes)
	 - Definition/Introduction of Timestamp ordering protocols
	 - Discussion on working of Timestamp ordering protocols using:
	    - WRITE operation
	    - READ operation
	 - Explanation with examples
	
	 - **Exercise** (10 minutes) –
	 - Group Discussion at the end of the session.
	 - Ask students to explain the Timestamp ordering protocols and its working
	
	 Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture http://www.infocobuild.com/education/audio-video-courses/computer-science/FundamentalsOfDatabaseSystems-IIT-Kanpur/lecture-40.html 3. Reference website: https://www.javatpoint.com/dbms-timestamp-ordering-protocol Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe

	Shamkant

	4. Homework
	
	  - Define Timestamp ordering protocols and its working using WRITE and READ operation
	  - What are the advantages and disadvantages of timestamp ordering compared to other concurrency control protocols?
	  - What is a strict timestamp ordering protocol?
	  - What is timestamp ordering? How does timestamp ordering work to ensure serializability?
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on Timestamp ordering protocols Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 22	Course Name: Database Management System Topic: Distributed Database Management systems	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to:
	  a. Understand the concept of Distributed database Management systems
	  b. Analyze its significance for an organization
	  c. Learn about the two types of DDBMS

Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	
	- Begin with a real-world example of a distributed database application (e.g., online banking, airline reservations).
	- Definition: Introduce the concept of distributed database management systems as systems that store and manage data across multiple interconnected computers
	
	- **Development** (30 minutes)
	- Definition/Introduction of DDBMS
	- Discussion on:
	      -Characteristics of DDBMS
	      -Advantages of DDBMS
	      -Types of DDBMS
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to explain the DDBMS and its types
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture http://www.infocobuild.com/education/audio-video-courses/computer-science/FundamentalsOfDatabaseSystems-IIT-Kanpur/lecture-40.html 3. Reference website: https://iq.opengenus.org/distributed-dbms/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe

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	4. Homework
	- What do you understand by DDBMS and elaborate its characteristics.
	- What are the challenges in ensuring atomicity, consistency, isolation, and durability (ACID) in a DDBMS?
	- What is a distributed database management system (DDBMS)?
	- What are the advantages of using a DDBMS?
	- What are the issues in designing and implementing a DDBMS?
	Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.
	2. Quiz on Distributed database Management systems
	Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 23	Course Name: Database Management System Topic: Deadlock	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Deadlock in DBMS b. Conceptualize the conditions required for deadlock
Teaching Aids (if any)	a. Power point presentation
Teaching Development	- **Introduction** (5 minutes) - Ask questions. - Begin with a real-world example of a deadlock situation (e.g., traffic jam, resource contention). - Definition: Introduce the concept of deadlock as a situation where two or more transactions are waiting for each other to release resources, resulting in a stalemate. - **Development** (30 minutes) - Definition/Introduction of Deadlock - Discussion on conditions required for deadlock: - Mutual exclusion condition - Hold and wait condition - No pre-emption condition - Circular wait condition - Explanation with examples - **Exercise** (10 minutes) – - Group Discussion at the end of the session. - Ask students to explain the concept of Deadlock Question and Answer session in between the lesson to check the presence of mind of students.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=xCxdBkFX_ww 3. Reference website: https://www.geeksforgeeks.org/deadlock-in-dbms/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant 4. Homework

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	- What are the methods for recovering from a deadlock in a DBMS? - What is a deadlock in a database management system (DBMS)? - What are the necessary conditions for a deadlock to occur? - How can a deadlock be harmful to a database system? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on Deadlocks Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 24	Course Name: Database Management System Topic: Recovery techniques	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Recovery Techniques b. Learn about the two types of Recovery Techniques
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	
	- Begin with a real-world example of a database failure (e.g., system crash, power outage).
	- Definition: Introduce the concept of recovery as the process of restoring a database to a consistent state after a failure.
	-
	- **Development** (30 minutes)
	- Definition/Introduction of Recovery Techniques
	- Discussion on two types of Recovery Techniques :
	  - Deferred Update
	  - Immediate Database Modification
	- Explanation with examples
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to explain the Recovery Techniques and its types
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture http://www.infocobuild.com/education/audio-video-courses/computer-science/FundamentalsOfDatabaseSystems-IIT-Kanpur/lecture-40.html 3. Reference website: https://www.geeksforgeeks.org/database-recovery-techniques-in-dbms/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant 4. Homework

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	- Explain the Recovery Techniques and its types - How is transaction rollback performed? - How can a database be recovered after a system crash? - How can a database be recovered after a media failure? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on Recovery Techniques Spend 5 minutes to evaluate student assimilation of the lesson contents

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Model Institute of Engineering
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Lesson Plan

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Lesson Plan No. 25	Course Name: Database Management System Topic: Transaction Processing	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Transaction processing in DBMS b. Categorize each Transaction processes c. Learn about the two operations involved in transaction processing
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	
	- Begin with a real-world example of a transaction (e.g., online purchase, bank transfer).
	- Definition: Introduce the concept of a transaction as a logical unit of work that is performed on a database.
	-
	- **Development** (30 minutes)
	- Definition/Introduction of Transaction processing
	- Discussion on three categories of Transaction processing
	   - Retrieval
	   - Update
	   - Mixed
	- Description on two operations of Transaction processing
	   - READ operation
	   - WRITE operation
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to explain the different Transaction processing
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://www.youtube.com/watch?v=5ammL5KU4mo 3. Reference website: https://www.javatpoint.com/dbms-transaction-processing-concept Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant

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	4. Homework - What is a transaction in a database system? - What are the ACID properties of a transaction? - Why are transactions important in database management? - What is the difference between a committed and an aborted transaction? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on transaction processing Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 26	Course Name: Database Management System Topic: : Structured Query Language	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of structured query language b. Analyze its significance for an organization c. Compare between the non-procedural and procedural query language
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	 - Ask questions.
	
	 What do you understand by query language?
	 Explain the non-procedural query language
	 -
	 - **Development** (30 minutes)
	 - Definition/Introduction of SQL
	 - Discussion on:
	    - Characteristics of SQL
	    - Advantages of SQL
	    - Types of SQL commands
	
	 - **Exercise** (10 minutes) –
	   - Group Discussion at the end of the session.
	     - Ask students to explain the concept of SQL and types of commands
	
	 Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://nptel.ac.in/courses/106/105/106105175/ 3. Reference website: https://www.javatpoint.com/dbms-sql-command Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant - The power of Oracle 9i by R. A. Parida 4. Homework

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	- What is SQL and what is its primary purpose? - Name the four main categories of SQL commands. - What is a database table and how is it structured? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on SQL commands Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 27	Course Name: Database Management System Topic: : Data Definition Language-Table creation management	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to:
	   a. Understand the role of Data Definition Language
	   b. Analyze the significance of using DDL for accessing database
	   c. Learn about various DDL commands

Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	
	- Begin with a real-world example of a transaction (e.g., online purchase, bank transfer).
	- Definition: Introduce the concept of a transaction as a logical unit of work that is performed on a database.
	-
	- **Development** (30 minutes)
	- Definition/Introduction of DDL
	- Discussion on DDL commands:
	     -CREATE
	     -ALTER
	     -DROP
	     -TRUNCATE
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to explain the different Transaction processing
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://nptel.ac.in/courses/106/105/106105175/ 3. Reference website: https://www.javatpoint.com/dbms-transaction-processing-concept 4. Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant - The power of Oracle 9i by R. A. Parida

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	5. Homework
	- What do you understand by DDL and elaborate role of each command
	- What is the syntax for creating a table using DDL?
	- How can you modify an existing table using DDL?
	- How do you delete a table using DDL?
	- What is the difference between TRUNCATE and DELETE statements?
	- How can you rename a table using DDL?
	Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.
	2. Quiz on DDL commands
	Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 28	Course Name: Database Management System Topic: : Data Manipulation Language	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the basic concepts and functions of DML. b. Learn how to insert, update, and delete data in a database using DML statements. c. Explore the use of joins and subqueries in DML
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	   - What do you understand by query?
	   - Basic understanding of database concepts and relational algebra.
	   - Familiarity with Data Definition Language (DDL) statements.
	
	- **Development** (30 minutes)
	- 1. **Introduction to DML**
	- Define DML and its role in database management.
	- Explain the difference between DDL and DML.
	- Discuss the common DML statements (INSERT, UPDATE, and DELETE).
	-
	- **2. INSERT Statements**
	- Demonstrate how to insert new rows into a table using the INSERT statement.
	- Explain the syntax and options available for INSERT statements (e.g., specifying column names, using default values).
	- Provide examples of inserting data into various data types.
	-
	- **3. UPDATE Statements**
	- Show how to modify existing rows in a table using the UPDATE statement.
	- Discuss the syntax and options for updating specific columns.
	- Demonstrate how to update multiple rows based on conditions.
	-
	- **4. DELETE Statements**
	- Explain how to delete rows from a table using the DELETE statement.
	- Discuss the syntax and options for deleting rows based on conditions.
	- Demonstrate how to delete all rows from a table.

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	- **Exercise** (10 minutes) – - Group Discussion at the end of the session. - Ask students to explain the different Transaction processing Question and Answer session in between the lesson to check the presence of mind of students.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://nptel.ac.in/courses/106/105/106105175/ 3. Reference website: https://www.javatpoint.com/dml-commands-in-sql 4. Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant - The power of Oracle 9i by R. A. Parida 5. Homework - What do you understand by DDL and elaborate role of each command - What is the syntax for creating a table using DDL? - How can you modify an existing table using DDL? - How do you delete a table using DDL? - What is the difference between TRUNCATE and DELETE statements? - How can you rename a table using DDL? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on DML commands Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 29	Course Name: Database Management System Topic: : Data Query Language	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Explain the purpose of DQL and how it differs from other SQL commands. b. Discuss the common DQL commands (SELECT, FROM, WHERE, ORDER BY, GROUP BY).
Teaching Aids (if any)	a. Power point presentation
Teaching Development	- **Introduction** (5 minutes) - Ask questions. - What do you understand by query? - Basic understanding of database concepts and relational algebra. - Familiarity with Data Definition Language (DDL) & DML statements. - **Development** (30 minutes) - **SELECT and FROM** - Demonstrate how to use the SELECT and FROM clauses to retrieve data from a table. - Practice selecting specific columns and all columns. - Introduce the concept of aliases for column names. - - **WHERE Clause** - Explain how to filter data using the WHERE clause. - Practice using comparison operators ($>$, $<$, $>=$, $<=$, $=$, $!=$). - Demonstrate using logical operators (AND, OR, NOT). - Introduce the concept of wildcard characters (% and _). - - **ORDER BY Clause** - Explain how to sort data using the ORDER BY clause. - Practice sorting in ascending and descending order. - Demonstrate sorting by multiple columns. - - **GROUP BY Clause** - Explain how to group data using the GROUP BY clause. - Demonstrate using aggregate functions (COUNT, SUM, AVG, MIN, MAX). - Practice grouping data by multiple columns.

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	- **Exercise** (10 minutes) – - Group Discussion at the end of the session. - Ask students to enlist the DQL commands Question and Answer session in between the lesson to check the presence of mind of students.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://nptel.ac.in/courses/106/105/106105175/ 3. Reference website: https://www.geeksforgeeks.org/sql-ddl-dql-dml-dcl-tcl-commands/#dql-data-query-language Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant - The power of Oracle 9i by R. A. Parida 4. Homework - Explain all the DQL commands - How do you select specific columns from a table using DQL? - How can you filter rows based on conditions using the WHERE clause? - What is the ORDER BY clause used for? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on DQL commands in SQL Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 30	Course Name: Database Management System Topic: : Data Query Language	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Data Control Language (DCL). b. Learn and practice basic DCL commands like GRANT, REVOKE, COMMIT, and ROLLBACK. c. Apply DCL commands to manage database permissions and transactions.
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	- Basic understanding of SQL syntax and database concepts.
	- Knowledge of DQL commands (SELECT, FROM, WHERE, ORDER BY, GROUP BY).
	
	- **Development** (30 minutes)
	- **1. Introduction to DCL**
	-
	- Explain the purpose of DCL and how it differs from other SQL commands.
	- Discuss the common DCL commands (GRANT, REVOKE, COMMIT, ROLLBACK).
	
	- **2. GRANT and REVOKE**
	-
	- Demonstrate how to grant and revoke privileges to users.
	- Practice granting and revoking select, insert, update, and delete privileges.
	- Introduce the concept of roles and how to assign privileges to roles.
	
	- **3. COMMIT and ROLLBACK**
	-
	- Explain the concept of transactions and their importance.
	- Demonstrate how to commit and rollback transactions.
	- Practice using COMMIT and ROLLBACK in various scenarios.
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	  - Ask students to enlist the DCL commands
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation

	from students on these. 2. Suggested NPTEL video lecture https://nptel.ac.in/courses/106/105/106105175/ 3. Reference website: https://www.geeksforgeeks.org/sql-ddl-dql-dml-dcl-tcl-commands/#dcl-data-control-language Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant - The power of Oracle 9i by R. A. Parida 4. Homework - Grant the "SELECT" privilege on the "customers" table to the "user1" user. - Revoke the "INSERT" privilege on the "orders" table from the "user2" user. - Create a new role named "manager" and grant all privileges on the "products" table to the role. - Insert a new customer record into the "customers" table. If an error occurs, rollback the transaction Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on DCL commands in SQL Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 31	Course Name: Database Management System Topic: : Inbuilt functions	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to:
	  a. Understand the concept of Inbuilt functions
	  b. Enlist various inbuilt functions

Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	   - What do you understand by functions?
	
	- **Development** (30 minutes)
	- Definition/Introduction of Inbuilt functions
	- Discussion on various functions
	  - Numerical Functions
	  - String Functions
	  - Date and Time Functions
	  - Aggregate Functions
	
	- **Exercise** (10 minutes) –
	  - Group Discussion at the end of the session.
	    - Ask students to enlist the Inbuilt functions
	Question and Answer session in between the lesson to check the presence of mind of students.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://nptel.ac.in/courses/106/105/106105175/ 3. Reference website: https://www.geeksforgeeks.org/sql-functions-aggregate-scalar-functions/ Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant - The power of Oracle 9i by R. A. Parida 4. Homework - What is the purpose of inbuilt functions in SQL? - Name five commonly used aggregate functions in SQL. - How do you calculate the average of a numeric column using SQL?

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	- What is the difference between the ROUND and TRUNC functions? - How can you extract the year from a date using SQL? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on Inbuilt functions in SQL Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 32	Course Name: Database Management System Topic: : Data Integrity constraints	Course No.: MCA 102

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of Data Integrity constraints b. Enlist various Data Integrity constraints
Teaching Aids (if any)	a. Power point presentation

Teaching Development	- **Introduction** (5 minutes)
	- Ask questions.
	   - What do you understand by constraints?
	   - What is data integrity?
	
	- **Development** (30 minutes)
	- **1. Introduction to Data Integrity**
	
	- Explain the concept of data integrity and its importance in database management.
	- Discuss the different types of data integrity constraints (entity integrity, referential integrity, domain integrity).
	
	- **2. Entity Integrity**
	
	- Demonstrate how to enforce entity integrity using primary keys.
	- Practice creating tables with primary keys.
	- Explain the significance of unique constraints.
	
	- **3. Referential Integrity**
	-
	- Explain the concept of foreign keys and their role in maintaining referential integrity.
	- Practice creating tables with foreign keys.
	- Demonstrate how to enforce referential integrity using ON DELETE and ON UPDATE actions.
	
	- **4. Domain Integrity**
	
	- Explain how to define data types and constraints to ensure domain integrity.
	- Practice using data types like INT, VARCHAR, DATE, etc.
	- Demonstrate using constraints like NOT NULL, CHECK, and DEFAULT.
	
	- **Exercise** (10 minutes) –
	- Group Discussion at the end of the session.

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	- Ask students to enlist the Data Integrity constraints Question and Answer session in between the lesson to check the presence of mind of students.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested NPTEL video lecture https://nptel.ac.in/courses/106/105/106105175/ 3. Reference website: https://www.javatpoint.com/dbms-integrity-constraints Suggested Reading books: - Database System Concepts by Korth, Silberchatz. - Fundamentals of Database System by ElmasriRame, Navathe Shamkant - The power of Oracle 9i by R. A. Parida 4. Homework - What is data integrity, and why is it important in databases? - What are the three main types of data integrity constraints? - What is the purpose of a primary key? - How does a foreign key help maintain referential integrity? - What is the difference between a NOT NULL constraint and a UNIQUE constraint? Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Quiz on data integrity constraints in SQL Spend 5 minutes to evaluate student assimilation of the lesson contents

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