Lesson Plan No. 1	Course Name: RDBMS	Course No.: COM-402

Objectives	At the end of the lesson, the student shall be able to: a. Understand the fundamentals of DBMS & RDBMS b. Explain the difference between DBMS & RDBMS c. Identify the real-life application of Database System
Teaching Aid	a. PowerPoint Presentation b. Short Video/Animated presentation
Teaching Development	1. **Introduction** (5 minutes) - What is data? - What is Information? - What is the difference between data & Information? 2. **Development** (30 minutes) a. Introduction to DBMS & RDBMS - Starting with a case study (**Student Management System**) - Introducing the concept of DBMS & RDBMS. - Characteristics of DBMS & RDBMS - Other storing techniques b. Animated Video of DBMS - https://www.youtube.com/watch?v=d11viALaCvA - 3. Exercise (10 minutes) – Activity: Identification of some more real- life examples of Database System by students from surroundings. -Quiz-1
Closure	Summarize the Lesson (through students/self), correlation with Learning Outcomes
Evaluation	Reflexive based on Lecture discussion

Check your progress 1

1. The database is

a. Collection of files **b.** Collection of information **c.** Collection of records
d. All of the above

2. Database Management System is

a. Software Program **b.** Collection of Fields **c.** Collection of Record
d. None of the above

Lesson Plan No. 1	Course Name: RDBMS	Course No.: COM-402

Objectives	At the end of the lesson, the student shall be able to: a) -Understand the concept of Database b) -Understand the Need of Database c) -Understand the Learning Path/Career Path in DB Jobs d) –Imagine the Size of a Data center e) -Identify softwares/web applications, where DB is used.
Teaching Aid	a. PowerPoint Presentation b. Short Video/Animated presentation
Teaching Development	- **Introduction** (10 minutes) - Discussion starts with real-life examples of different systems (facebook) | Introduction Video (8:20):https://www.youtube.com/watch?v=_r97qdyQtIk - Organizations are using which techniques for data storage and Why? (MAANG companies) - **Development** (30 minutes) - **Career & Job Perspective (**Database Administrator**,** Data Analyst, Market Research Analyst**)** - Discussion on Coursera Certification by IBM - Oracle Database 12c Administrator Certified Associate - Microsoft Certified: Azure Database Administrator Associate - For More Oracle Certification :(Oracle University) - Introduction of Course (RDBMS) b. Examples of DBMS-(10 minutes) - Real-world examples.(Banking Management System, Pi360) - IT Industry (Meta) - Online Bookings (E-Ticketing)
Closure	Summarize the Lesson correlation with Learning Outcomes

Lesson Plan No. 2	Course Name: RDBMS	Course No.: COM-402

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of DBMS Engine b. Illustrate difference between types of Databases Applications c. Analyse different Database Architectures & their characteristics
Teaching Aids	a. PowerPoint Presentation b. Animation/Video Resources
Teaching Development	1. **Introduction** (5 minutes) - Have a discussion on the importance of data and storage in real-time. - Introducing the concept of Languages. Show Figures on slide. - Introduce the formal definition of DBMS - Highlight the importance of characteristics of the DBMS 2. **Development** (30 minutes) a. Introduction to DBMS Engine - Introducing the concept of DBMS Applications & Architecture (**University DB example**). - Database Users and Administrators (**Practical Demo: PI360**) - Structures of a Data Models (Case based **examples**) b. Examples of DBMS - Real world examples - Home/local examples 3. Exercise (10 minutes) – - Have a discussion to summarize the lecture. - Ask Questions Related to Topic - Differentiate between concepts, advantage & different applications of DBMS and its modelling.
Closure	1. Summarize the Lesson, Learning Outcomes and get affirmation from students on these. 2. Suggested Reading Database System Concepts, Korth, Silberchatz, Mcgraw Hill Edu. 7th Edition **(Page-18-25)** Spend 5 minutes to wrap up and consolidate the leanings.
Evaluation	1. Reflective Questions. Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

Check your progress 1

1. What is the full form of DBMS?

a. Data of Binary Management System **b.** Database Management System
c. Database Management Service **d.** Data Backup Management System

2. Who created the first DBMS?

a. Edgar Frank Codd **b.** Charles Bachman **c.** Charles Babbage
d. Sharon B. Codd

3. Which of the following is not a type of database?

a. Hierarchical **b. Network** **c.** Distributed **d.** Centralized
e. Relational f. NoSQL g. Cloud h. Object-oriented
i. None of the above

Lesson Plan No. 3	Course Name: RDBMS	Course No.: COM-402

Objectives	At the end of the lesson the student will be able to: a. Historical Evolution of Database b. Identify different Database designs and Used techniques.
Teaching Aids	a. PowerPoint Presentation b. YouTube NPTEL video
Teaching Development	1. **Introduction** (5 minutes) - Review the previous concepts. - Specify the advantages of using Database 2. **Development** (30 minutes) a. Historical Evolution of Database - Discussion on timeline and evolution of different database systems. - Features of Database Management System - Types of Database - Language required for DB b. Examples of DBMS - Real world examples - Home/local examples 3. Exercise (10 minutes) – - Have a discussion to summarize the lecture - Ask Questions Related to the Topic - Differentiate between concepts, advantages & different applications of DBMS
Closure	1. Summarise the Lesson, Learning Outcomes and get affirmation from students on these. 2. Suggested Reading Database System Concepts, Korth, Silberchatz, Mcgraw Hill Edu. 7th Edition **(Page-1-17)** Spend 5 minutes to wrap up and consolidate the leanings.
Evaluation	1. Reflective Questions . Allow students to answer and discuss.

Check your progress 1

1. Which of the following is not a feature of DBMS?

a. Minimum Duplication and Redundancy of Data **b.** High Level of Security
c. Single-user Access only **d.** Support ACID Property

2. Which of the following is a component of the DBMS?

a. Data **b.** Data Languages **c.** Data Manager **d.** All of the above

3. Which of the following is known as a set of entities of the same type that share the same properties, or attributes?

a. Relation set **b.** Tuples **c.** Entity set **d.** Entity Relation model

4. Enlist the properties of the Database.

- Cells contain atomic values.
- Values in a column are of the same kind.
- Each row is unique.
- Each column has a unique name
- No two tables can have the same name in a relational schema.
- The sequence of rows is insignificant.
- The sequence of columns is insignificant.

Lesson Plan No. 4	Course Name: RDBMS	Course No.: COM-402

Objectives	At the end of the lesson the student shall be able to: a. Draw the uses and advantages of DBMS b. Understand the Database Architecture c. Understand the concept of Data Modelling
Teaching Aids	a. PowerPoint Presentation b. YouTube animated video
Teaching Development	1. **Introduction** (10 minutes) - Revision of Previous class - Specify real life example of RDBMS - Difference between flat file system and RDBMS 2. **Development** (30 minutes) a. Introducing the concept of DBMS Applications & architecture. - Database Users and Administrators - Structures of a Data Models b. Examples of DBMS - Real world examples (University Database Management System) 3. Exercise (10 minutes) – - Have a discussion to summarise the lecture - Ask Questions Related to the Topic - Think-Pair-Share (One real life example of RDBMS and its modelling)
Closure	1. Summarise the Lesson, Learning Outcomes and get affirmation from students on these. 2. Suggested Reading Database System Concepts, Korth, Silberchatz, Mcgraw Hill Edu. 7th Edition **(Page 18-25)** Spend 5 minutes to wrap up and consolidate the leanings.
Evaluation	1. Outcome based on discussion, Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

Check your progress 1

1. The database is

a. Collection of files **b.** Collection of information **c.** Collection of records
d. All of the above

2. Database Management System is

a. Software Program **b.** Collection of Fields **c.** Collection of Record
d. None of the above

3. Open Database Connectivity is

a. Driver **b.** Fields **c.** Software **d.** None of the above

4. Enlist the advantages of the database.

5. Enlist the Problems in the Relational database.

6. Define the following terms with respect to RDBMS

- Domain: Domain is a set of atomic values.
- Atomic: By atomic we mean that each value in the domain is indivisible as far as the formal relational model is concerned.
- Data forming: A common method of specifying a domain is to specify a data type from which the data forming the domain are drawn.
- Table(Relation): A relation is a set of tuples/rows/entities/records.
- Tuple: Each row of a relation/table is called a tuple.
- Degree: Number of columns/attributes of a relation.
- Cardinality: Number of rows/tupes/records of a relational instance.

Lesson Plan No. 5	Course Name: RDBMS	Course No.: COM-402

Objectives	At the end of the lesson the student will be able to: a. Understand the concept of Records and Files, b. Apply the role of Records and file systems. c. Design the concept of data Abstraction and data Integration
Teaching Aids	a. PowerPoint Presentation b. YouTube NPTEL video
Teaching Development	1. **Introduction** (5 minutes) - Revision of the previous lecture. - Ask questions 2. **Development** (30 minutes) a. Introduction to Records and file systems. -Records with examples -File system and its architecture -How they are useful to DBMS concepts. -the difference between data abstraction and data integration b. Examples of DBMS - University Database Management System 3. Exercise (10 minutes) – - Have a discussion to summarize the lecture - Ask Questions Related to the Topic - Group
Closure	1. Summarise the Lesson, Learning Outcomes and get affirmation from students on these. 2. Suggested Reading Database System Concepts, Korth, Silberchatz, Mcgraw Hill Edu. 7th Edition **(Page-1-17)** Spend 5 minutes to wrap up and consolidate the leanings.
Evaluation	1. Reflective Questions . Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

Check your progress 1

1. An RDBMS developer refers to a record as

a) Tuple b) Data c) Relation d)None of these

2. The database system catalogue stores what kind of information?

a) A number of blocks b) Number of tuples

c) Size of tuples mentioned d)All of the above

3. The relational model of RDBMS is concerned with:

a) Data Structure b) Data Manipulation
c) Data Integrity d) All of these

Lesson Plan No. 6	Course Name: RDBMS	Course No.: COM-402

Objectives	At the end of the lesson the student shall be able to: a. Articulate the concept of Data Views and Data Independence, b. Levels of Data Independence
Teaching Aids (if any)	a. PowerPoint Presentation b. YouTube NPTEL video
Teaching Development	1. **Introduction** (5 minutes) - Revision of Previous Lecture - Ask questions 2. **Development** (30 minutes) a. Introduction to Data views - Introducing the concept of DBMS Architectures. - Different levels of views Database - Physical Data Independence - Logical Data Independence - Animated Video Data Independence b. Examples of DBMS - Real world examples Data Independence with Student Database Management System 3. Exercise (10 minutes) – - 5 minute paper Activity with Bank Management System - Share their views with the class.
Closure	1. Summarize the Lesson, Learning Outcomes and get affirmation from students on these. 2. Suggested Reading Database System Concepts, Korth, Silberchatz, Mcgraw Hill Edu. 7th Edition **(Page-18-25)** Spend 5 minutes to wrap up and consolidate the leanings.
Evaluation	- Discussion based on Activity. Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 7	Course Name: RDBMS	Course No.: COM-402

Objectives	At the end of the lesson the student shall be able to: a. Articulate the concept of Data Associations b. Define the concept of Data models and its classification.
Teaching Aids (if any)	a. PowerPoint Presentation b. YouTube NPTEL video
Teaching Development	1. **Introduction** (5 minutes) - Revision of the previous class. - Ask questions 2. **Development** (30 minutes) a. Introduction to Data Associations - Introducing the concept of association. - Show live examples of data association. - Introduction of Data models - Importance of Data models - Classification of Data models b. Examples of DBMS - Real world examples - Home/local examples 3. Exercise (10 minutes) – - Have discussion to summarize the lecture - Ask Questions Related to Topic - Differentiate between concepts , advantage & different applications of DBMS
Closure	1. Summarize the Lesson, Learning Outcomes and get affirmation from students on these. 2. Suggested Reading Database System Concepts, Korth, Silberchatz, Mcgraw Hill Edu. 7th Edition **(Page-1-17)** Spend 5 minutes to wrap up and consolidate the leanings.
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

Activity inside the classroom

Readings: Book-1 : Pages:1 - 17
Video Lecture: Link Here

Example: Pi360

1. Formal discussion with an Image.

i. Show an image and ask student to identify the materials, data, information, and techniques used.

ii. Ask students to justify their answer.

iii. Start with the basic question defined in Lesson plan. (Data, information, record, files, etc.)

iv. Discuss the importance of each independent identity (data, information, record, files, etc.)

v. Show a visual material to let them understand these independent identities (data, information, record, files etc.)

vi. Ask students to create a memo from the shown video/animation.

vii. Start with Presentation and explanation. (Introduction, background information, importance, direct relation with industry etc.)

viii. Ask students to observe the shown examples and identify the common properties.

ix. Go back to the next slide and discuss the characteristics of dbms, rdbms, advantage and disadvantage of dbms, rdbms.

x. Discuss the difference between dbms and rdbms.

xi. Test their progress (Quiz-1)

xii. Conclude the session and show the next topic with a brief introduction.

----------Close the lecture 1----------

Check your progress 1

1. Database is:

a. Collection of files **b.** Collection of information **c.** Collection of records
d. All of the above

2. Database Management System is:

a. Software Program **b.** Collection of Fields **c.** Collection of Record
d. None of above

3. Open Database Connectivity is:

a. Driver **b.** Fields **c.** Software **d.** None of above

Lesson Plan No. 8	Course Name: RDBMS	Course No.: COM-402

Objectives	At the end of the lesson the student shall be able to: a. Conclude the Database concepts, its architectures, types and characteristics. b. Theorize the difference between types of Databases Applications, its advantages and disadvantages, records, and files. c. discover the concept of database modelling, classification.
Teaching Aids (if any)	a. PowerPoint Presentation b. YouTube animated video
Teaching Development	1. **Introduction** (7 minutes) -Summary Video -Ask Students to summarise all the topics mentioned in the syllabus and discovered in the classroom. 2. **Development** (30 minutes) - Student will define the concepts one by one - Use a roll number to call them. 3. Exercise (5 minutes) – - Quiz final Unit-1
Closure	1. Summarize the Lesson, Learning Outcomes and get affirmation from students on these. 2. Suggested Reading Database System Concepts, Korth, Silberchatz, Mcgraw Hill Edu. 7th Edition **(Page-18-25)** Spend 5 minutes to wrap up and consolidate the leanings.
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 9	Course Name: RDBMS	Course No.: COM-402

Objectives	At the end of the lesson the student shall be able to: a. produce the ER diagram of real-world database problems. b. interpret the basic concepts and constraints of ER models
Teaching Aids (if any)	a. PowerPoint Presentation b. YouTube NPTEL video
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. What is the Database modelling? - How we can represent in the form of pictorial representation. 2. **Development** (30 minutes) a. Introduction to ER models - Introducing the basic concept of ER model and its representation - Introduction to different relationship constraints - design issues ER models b. Examples of DBMS - Real world examples - Home/local examples 3. Exercise (10 minutes) – - Have discussion to summarize the lecture. - Ask Questions Related to Topic - Differentiate between concepts, advantage & different applications of DBMS and its modelling.
Closure	1. Summarize the Lesson, Learning Outcomes and get affirmation from students on these. 2. Suggested Reading Database System Concepts, Korth, Silberchatz, Mcgraw Hill Edu. 7th Edition **(Page-18-25)** Spend 5 minutes to wrap up and consolidate the leanings.
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

Activity inside the classroom

Readings: Book-1 : Pages:1 - 17
Video Lecture: Link Here

Example: Pi360

1. Formal discussion with an Image.

i. Show an image and ask student to identify the models.

ii. Ask students to draw the relationship between different attributes used in that model.

iii. Start with the basic question defined in Lesson plan.

iv. Discuss the importance of each independent symbols used in ER diagram.

v. Show a visual material to let them understand these independent symbols.

vi. Ask students to create a memo from the shown video/animation.

vii. Start with Presentation and explanation. (Introduction, background information, importance, direct relation with industry etc.)

viii. Ask students to observe the shown examples and identify the common properties.

ix. Test their progress (Quiz-1)

xii. Conclude the session and show the next topic with a brief introduction.

----------Close the lecture 1----------

Check your progress 1

1. Database is:

a. Collection of files **b.** Collection of information **c.** Collection of records
d. All of the above

2. Database Management System is:

a. Software Program **b.** Collection of Fields **c.** Collection of Record
d. None of above

3. Open Database Connectivity is:

a. Driver **b.** Fields **c.** Software **d.** None of above

Lesson Plan No. 10	Course Name: RDBMS	Course No.: COM-402

Objectives	At the end of the lesson the student shall be able to: c. determine the ER designing issues. d. design the ER diagram and identify the weak entity sets.
Teaching Aids (if any)	c. PowerPoint Presentation d. YouTube NPTEL video
Teaching Development	4. **Introduction** (5 minutes) - Revision of previous lecture - Ask questions. 5. **Development** (30 minutes) b. Introduction to ER models - ER model designing issues - Introduction to different relationship constraints - Weak entity sets b. Examples of DBMS - Real world examples - Home/local examples 6. Exercise (10 minutes) – - Have discussion to summarize the lecture. - Ask Questions Related to Topic - Differentiate between concepts, advantage & different applications of DBMS and its modelling.
Closure	3. Summarize the Lesson, Learning Outcomes and get affirmation from students on these. 4. Suggested Reading Database System Concepts, Korth, Silberchatz, Mcgraw Hill Edu. 7th Edition **(Page-18-25)** Spend 5 minutes to wrap up and consolidate the leanings.
Evaluation	2. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

Activity inside the classroom

Readings: Book-1 : Pages:1 - 17
Video Lecture: Link Here

Example: Pi360

1. Formal discussion with an Image.

i. Show an image and ask student to identify the models.

ii. Ask students to draw the relationship between different attributes used in that model.

iii. Start with the basic question defined in Lesson plan.

iv. Discuss the importance of each independent symbols used in ER diagram.

v. Show a visual material to let them understand these independent symbols.

vi. Ask students to create a memo from the shown video/animation.

vii. Start with Presentation and explanation. (Introduction, background information, importance, direct relation with industry etc.)

viii. Ask students to observe the shown examples and identify the common properties.

ix. Test their progress (Quiz-1)

xii. Conclude the session and show the next topic with a brief introduction.

----------Close the lecture 1----------

Check your progress 1

1. Database is:

a. Collection of files **b.** Collection of information **c.** Collection of records
d. All of the above

2. Database Management System is:

a. Software Program **b.** Collection of Fields **c.** Collection of Record
d. None of above

3. Open Database Connectivity is:

a. Driver **b.** Fields **c.** Software **d.** None of above

Lesson Plan No.11	Course Name: RDBMS	Course Code: COM-402

Topics	● **Introduction to ER Diagram**
Objectives	At the end of the lesson the student shall be able to answer the following questions: **a. What are the various types of entities, entity sets, attributes and keys?** **b. Describe the various types of relationships sets, roles and structural constraints.**
Teaching Aids (if any)	a. PPTs. b. Green board (Chalk & Talk). c. Use of Mentimeter
Teaching Development	1. Introduction (5 minutes) **Ask questions**: - Explain the various types of data model. 2. Development (30 minutes) a. Introduction to ER Diagram - Explanation of entity types, entity sets, attributes and keys **(Example Student Database)** - Explain various relationship types, relationship sets, roles and structural constraints. - Illustrate weak entity types b. Animated Video LINK: c. Summarize ER Diagrams. 3. Exercise (10 minutes) – - Activity - Mentimeter Activity
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. 3. Suggested Reading books: Fundamentals of Database Systems by R. Elmasri, Navathe, 6th Edition, Pearson. ✓ **Pages:** Page No. 202-217 **Homework**: **1. Activity**: Describe the importance of ER diagram. Spend 5 minutes to wrap up and consolidate the leanings.

Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss. **2.** Quiz on ER Diagram. **3.** MCQ / Sessional Test / Assignments Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No.12	Course Name: RDBMS	Course Code: COM-402

Topics	● **Integrity Constraints**
Objectives	At the end of the lesson the student shall be able to answer the following questions: **a. What are Integrity Constraints?** **b. Describe the various types of Integrity Constraints.**
Teaching Aids (if any)	a. PPTs. b. Green board (Chalk & Talk). c. Use of Mentimeter
Teaching Development	1. Introduction (5 minutes) **Ask questions**: **a. What are the various types of entities, entity sets, attributes and keys?** **b. Describe the various types of relationships sets, roles and structural constraints.** 2. Development (30 minutes) a. Introduction to ER Diagram - Introduction to Integrity Constraints - After introduction of the topic, various types of integrity constraints will be discussed with the help of suitable example. b. Animated Video LINK: Lecture Duration: Time Stamp: Lecture Link: c. Summarize Integrity Constraints. 3. Exercise (10 minutes) – - Activity - Mentimeter Activity
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading books: Database System Concepts Korth, Silberchatz, Mcgraw Hill Education, 6th Edition

	Pages: Page No. 128-136 **Homework**: **1. Activity**: Describe the importance of Integrity Constraints. Spend 5 minutes to wrap up and consolidate the leanings.
Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss. **2.** MCQ / Sessional Test / Assignments Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No.13	Course Name: RDBMS	Course Code: COM-402

Topics	• **Introduction to Keys in DBMS**
Objectives	At the end of the lesson the student shall be able to answer the following questions: **a. What is the role of Keys in DBMS?** b. What are Keys? Illustrate different types of Keys with examples.
Teaching Aids (if any)	a. PPTs. b. Green board (Chalk & Talk). c. Nearpod Activity
Teaching Development	1. Introduction (5 minutes) **Ask questions**: **a. What are Integrity Constraints?** **b. Describe the various types of Integrity Constraints.** 2. Development (30 minutes) a. Introduction to Keys - Discussion starts with example and introducing the concept of Keys . - Role of Keys in DBMS. - Explaining different types of keys with examples. - b. Animated Video LINK: Lecture Duration: Time Stamp: Lecture Link: c. Summarize Keys. 3. Exercise (10 minutes) – - Activity - Nearpod Activity
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading books: Database System Concepts Korth, Silberchatz, Mcgraw Hill Education, 6th Edition **Pages:** Page No. 45-46 **Homework**: **1. Activity**: Describe the importance of Keys with examples.

	Spend 5 minutes to wrap up and consolidate the leanings.
Evaluation	1. Reflective Questions (What, why, Who?). Allow students to answer and discuss. **2.** MCQ / Sessional Test / Assignments Spend 5 minutes to evaluate student assimilation of the lesson contents