1. **Course Number and Course Title:**

   CMP 320 - Database Systems

2. **Credit Hours:**

   3 – 2 – 3

3. **Prerequisites and/or Co-Requisites:**

   Prerequisites: CMP 305 (Data Structures and Algorithms)

4. **Name and Contact Information of Instructor:**

   Name: Dr. Osameh Al-Kofahi

5. **Course Description (Catalog Description):**

   Introduces the basic principles of database management systems; data models, including conceptual and logical models; translation between data models; query languages; normalization of relations; and database application development.

6. **Textbook and other Supplemental Material:**

   Textbook:
   - R. Elmasri, S. Navathe, *Fundamentals of Database Systems*, 7th edition. Pearson, 2017.

   Other supplemental material:
   - Lecture Notes.

7. **Course Learning Outcomes:**

   Upon completion of the course, students will be able to:
   1. Describe the different components and benefits of a commercial-grade database system.
   2. Model data requirements using entity-relationship (ER) and extended entity-relationship (EER) diagrams.
   3. Map ER and EER diagrams into relational schema.
   4. Express database queries using relational algebra and relational calculus.
   5. Write SQL statements to create queries and modify database schemas.
   6. Understand functional dependences and their use in defining normal forms up to 3rd and BCNF normal forms.
   7. Understand some advanced concepts in database systems including indexing, transaction processing, and crash recovery algorithms.
   8. Design, implement and run a database application using a commercial grade (Oracle for example) database management system platform.

8. **Teaching and Learning Methodologies:**

   Methods include lectures, labs, homework, quizzes, exams and class discussions. Typically, 5 to 6 quizzes will be conducted throughout the semester with a prior notice of one week.

9. **Course Topics and Schedule:**

Topic	Weeks
Database Management Systems characteristics, components, advantages, and architecture.	1
Data modeling and Entity Relationship (ER) diagrams	1

Enhanced Entity Relationship (EER) diagrams	1
Map ER diagrams to relational schema	1
Map Enhanced Entity Relationship (EER) diagrams to relational schema	1
The relational data model and relational algebra	1
The relational algebra - part 1	1
The relational algebra - part 2	1
Relational calculus	1
Data Definition SQL Language	1
Data Manipulation SQL Language	1
Advanced SQL queries	1
SQL stored procedures, triggers, and views	1
Functional dependencies and normalization	1
Introduction to advanced topics in database systems including indexing, transaction processing, and crash recovery algorithms.	1
Review and evaluation	1
Total:	**16**