

COURSE SYLLABUS FORM

**American University of Beirut
Faculty of Arts and Sciences
Department : Computer Science**

Course Number and Title: CMPS 277, Database Systems

1. Course Learning Outcomes

- Design a conceptual database schema using the E-R model.
- Convert an E-R schema into a relational schema.
- Query a relational database in the relational algebra and tuple relational calculus languages.
- Create a relational database (schema and instance) in SQL.
- Query and manipulate a relational database in SQL.
- Identify integrity constraints, such as domain constraints, candidate keys, referential integrity constraints, and implement them in SQL.
- Identify more complex integrity constraints, and implement them with triggers in PL/SQL.
- Decompose a relation in BCNF or 3NF using functional dependencies.
- Describe different file storage approaches and indexing methods.

2. Resources Available to Students

Textbook: Database System Concepts, by A. Silberschatz, H. Korth, S. Sudarshan.
McGraw-Hill, Fourth edition, 2002.

3. Grading Criteria

Midterm: 45%

Final: 45%

Assignments: 5%

Participation in class: 5%

4. Schedule

Week	Topic	Activities	Assignments
1	Introduction. Entity-Relationship (E-R) Model: basic concepts.	lecture	
2	Design issues, mapping constraints, keys, E-R diagram, weak entity sets.	lecture	
3	Extended E-R features, reduction of an E-R schema to tables.	lecture	
4	Relational Model: structure of relational databases, relational algebra.	lecture	Assignment 1
5	Tuple relational calculus, extended relational-algebra operations, modification of the database, views.	lecture	
6	SQL: basic structure, set operations, aggregate functions, null values, nested subqueries, views.	lecture	Assignment 2
7	Modification of the database, data-definition language, embedded SQL.	lecture	
8	Creating a database (schema and instance), querying and manipulating a database. Integrity Constraints: domain constraints, referential integrity.	lab session lecture	Assignment 3
9	Revision sessions (before midterm).	problem sets	
10	Triggers, functional dependencies.	lecture	
11	Relational Database Design: decomposition.	lecture	Assignment 4
12	Normalization using functional dependencies.	lecture	
13	Storage and File Structure: storage access, file organization, organization of records in files.	lecture	Assignment 5
14	Indexing and Hashing: basic concepts, B-Tree index files, hashing, index definition in SQL.	lecture	
15	Revision sessions (before final).	problem sets	

5. Course Policy (if any)

A student who misses an exam (midterm or final) must submit a valid excuse (e.g. medical report from the AUB infirmary), within two weeks from the date of the exam, in order to have a make-up exam; otherwise, he/she will get a grade of zero.

Cheating in doing the assignments (copying the solution of another student) will result in a grade of zero for both students.

Cheating during the exams will result in a grade of zero and it can result in a warning from the Dean's Office.