NAU NORTHERN ARIZONA UNIVERSITY

Course Title: CS 345 Database Systems
Term: Summer 2023
Instructor: TBA
Course Credit: 3
Mode of Instruction: Online

Course Description:

This course gives basic concepts in database systems, including data manipulation language and data definition language. The relational model and its implementation will be covered in depth together with an overview of SQL. The course also provides a study of data models, data description languages, and query facilities including relational algebra and SQL, data normalization, transactions and their properties, physical data organization and indexing, security issues and object databases. Students will learn and implement the principles and concepts of information integrity, security and confidentiality.

Course Prerequisites:

CS 249 Data Structures

Learning Outcomes:

By the end of the course, the student should be able to:

A. Install, configure, and interact with a relational database management system;

B. Understand and master the specific methods and steps of relational database design;

C. Describe, define and apply the major components of the relational database model to database design;

D. Understand the role of database backup and data replication;

E. Apply the principles and practices of good database design and analysis in real-life problems..

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Course Material:

Abraham Silberschatz, Henry F. Korth, S. Sudarshan, ***Database System Concepts***, 6th Edition.

Evaluation:

- Homework [40%]
- Mid-term Exam [25%]
- Final Exam [35%]

Description of the Evaluation tasks:

Assignment/ Essay/ ... : During the term, students will be required to finish several evaluation tasks within due date. All the tasks are linked with specific course topics/outcomes and will adequately assess students' competence and learning outcomes. Students are encouraged to meet with instructor about these tasks at any point.

Mid-term/ Final Exams/ Quiz/... : There may be periodic quizzes given at the beginning of lecture sessions; the feedback from these quizzes will monitor the progress of the learners and help to set learning priorities. There will be mid-term exam/ final exam for the course. They are the basic criteria for the evaluation of students' learning outcomes and final grade.

Grading Policy:

Students are supposed to finish each online lecture. Prior to each class, students should finish the required readings. During the class time, students are encouraged to make use of all relevant online course resources and communicate with the instructor. Students' grades are accumulated based on the cumulative evaluations.

Students' letter grade will be assigned according to the following scale:

A+ 90-100	A 85-89	A- 80-84
B+ 77-79	B 73-76	B- 70-72
C+ 67-69	C 63-66	C- 60-62
D+ 57-59	D 53-56	D- 50-52
F < 50		

Academic Integrity:

Students must strictly adhere to the university's academic integrity rule; and all essays, exams and any other form of academic assignments must adhere to these rules. Any form of plagiarism, cheating, or misappropriation of materials will be considered a violation of academic integrity and will be punishable by the university.

Withdrawal from the Course(s):

Students will be able to apply for a transfer or withdrawal within 3 days of the starting date of the course. If a withdrawal is applied for within 3 working days, the tuition fee will be fully refunded. After 3 days, the tuition fee will not be refunded. If a withdrawal is applied for in the first two weeks, it will be recorded as W (Withdraw) on the course transcript. After this initial two-week period, the class will be recorded as F (Fail).

Tentative Schedule:

1	Introduction to Database System
2	Introduction to the Relational Model
3	Introduction to SQL Intermediate SQL Advanced SQL
4	Formal Relational Query Languages
5	Database Design and the E-R Model **Homework#1**

6	Relational Database Design
7	Application Design and Development
8	Storage and File Structure
9	Indexing and Hashing
10	Query Processing and Query Optimization **Homework#2**
11	**Midterm Test**
12	Transactions Concurrency Control
13	Recovery System
14	Database-System Architectures
15	Parallel Databases **Homework#3**
16	Distributed Databases
17	Data Warehousing and Mining
18	Information Retrieval
19	Object-Based Databases
20	Spatial and Temporal Data and Mobility **Homework#4**
21	Advanced Transaction Processing
22	PostgreSQL IBM DB2 Universal Database Microsoft SQL Server
23	Triggers
24	Adanced Aggregation Features
25	**Final Exam**