

Texas Tech University
Department of Computer Science

Course Name: Concepts of Database Systems

Number: CS4354

Section: 001

Semester: Spring 2016

Instructor Name: Cong Pu

Office: 304 ENGCTR

Email: cong.pu@ttu.edu

Office Hours: 4:00pm-5:00pm (Tuesday, Thursday) or by appointment

Class Room: 204 ENGCTR

Class Hours: 12:30pm-1:50pm (Tu, Th)

TA: TBA

TA-Office: TBA

TA-Email: TBA

TA-Office Hours: TBA

Textbook:

Database Systems: A practical Approach to Design, Implementation, and Management, 6 edition (January 18, 2014). Thomas and Connolly. ISBN: 978-0132943260.

First Course in Database Systems, Jeffrey D. Ullman, Jennifer Widom. Prentice Hall; 3rd edition; ISBN: 9780136006374

Catalogue Listing:

Overview of a database system and its components; physical organization of data; data models; relational databases; and query processing.

Course Objectives:

To help students understand data modeling concepts including relational model for storage and retrieval of information, data query languages such as SQL, and current database technologies.

Key Topics:

1. Relational databases
2. Other database models such as OO and deductive and XML
3. Relational algebra
4. Queries such as SQL
5. Other database technologies
6. Database design

Course Prerequisites: CS3364 (Design and Analysis of Algorithms)

Expected prior knowledge and skills in: Programming proficiency

Learning Outcomes & Assessment Methods: Students who have completed this course should have the ability to:

Objective	ABET Outcomes	Assessment Method
Understand the fundamental principles of the relational data model	a, b ,k	Homework , Quiz, Exam
Formulate an Entity-Relationship (ER) diagram as conceptual design of database requirements	a, b ,k	Homework, Quiz, Exam
Map ER diagrams to relational schemas	a, b ,k	Homework, Quiz, Exam
Formulate a correct relational algebra expression to answer a query using a query language such as SQL that involves select-project-join, negation, union, intersection, minimum/ maximum, and a limited form of counting	i	Homework, Quiz, Exam
Apply database theory to practice by creating a database application using a commercial database product	i, k	Homework, Quiz, Exam
Understand the current database technologies such as object-oriented databases, or XML	i	Homework , Quiz, Exam

Grading Policy: The final grade for this course will be based on the following categories:

- Attendance: **10%**.
 - Each 1 point penalty will be given to each missing after the first two absences.
 - Absence with doctor notes is acceptable.
- Quiz: **10 %**
 - The date for quizzes will be announced before. There is no make-up for missing quiz.
 - The lowest point will be dropped.
- Homework: **50%**.
 - Five HWs, 10% for each one.
 - HW_1, individual work.
 - HW_2 – HW_5, team work (2 members for each team, equal contribution for each member).
- Exam: **30%**. (first exam: 10%, second exam: 10 %, final exam: 10%)
 - Students are required to **take exam on exam date**. There is no make-up for missing exam.
- ALL HWs **MUST** be submitted to **instructor**. **No late submission allowed.**
- ALL HWs **MUST** be submitted as instructed by instructor.
- The instructor reserves the right to explain the confusing issues.
- The usual grading scale will be used:
 - A 90-100
 - B 80-89
 - C 70-79
 - D 60-69
 - F Below 60

Ethical Conduct: Although students are encouraged to discuss ideas and problems with the TA, instructor and other students, academic dishonesty will not be tolerated. **It is your responsibility to educate yourself about actions that constitute academic dishonesty.** If you are not sure whether a specific action is allowed, contact the instructor and/or the TA before you indulge in it! All submitted homework will be randomly checked for plagiarism. Academic dishonesty of any kind, if discovered, will result in a grade of 0 for the corresponding assignment. Any student who is caught indulging in academic dishonesty more than once will lead to a grade of “F” in the course, and further action according to the TTU operating procedures: <http://www.depts.ttu.edu/opmanual/OP34.12.pdf>

Classroom Civility:

All violations of classroom civility will be reported to the Student Judicial Programs. The Texas Tech University Catalog states: “Students are expected to assist in maintaining a classroom environment that is conducive to learning.” In order to ensure that all students gain from time spent in class, **students are prohibited from engaging in any form of distraction**, e.g., reading newspapers (or other articles), working on other courses, and using cell-phones or laptops for calls or messages. If you indulge in any such inappropriate behavior (without explicit consent of the instructor), you will (at the very least) be asked to leave the classroom.

Student with Disabilities:

Any student who, because of a disability, may require special arrangements in order to meet course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services Office in 335 West Hall or 806-742-2405.

Course Schedule: This schedule is tentative and subject to change.

All changes will be announced in class or on the course website (Blackboard). Students are responsible for making sure they are informed about announcements.

- Jan 21: Course Introduction
- Jan 26: Introduction to Database
- Jan 28: Database Environment
- Feb 02: Relational Model
- Feb 04: Relational Model; Relational Algebra
- Feb 09: Relational Algebra
- Feb 11: Relational Algebra exercise; **Release HW_01**
- Feb 16: Database System Design Lifecycle
- Feb 18: Conceptual Database Design; **HW_01 Due**
- Feb 23: Conceptual Database Design; **Release HW_02_Conceptual_Design**
- **Feb 25: First Exam**
- Mar 01: Entity Relationship Modeling
- Mar 03: Entity Relationship Modeling

- Mar 08: Information Modeling; **HW_02_Conceptual_Design Due**
- Mar 10: Logical Database Design; **Release HW_03_Logical_Design**

- **Mar 15: Spring break**
- **Mar 17: Spring break**

- Mar 22: Normalization
- Mar 24: Advanced Normalization; **HW_03_Logical_Design Due**

- Mar 29: SQL: Data Manipulation
- Mar 31: SQL: Data Definition

- Apr 05: Physical Database Design; **Release HW_04_Physical_Design**
- **Apr 07: Second Exam**

- Apr 12: Object Oriented Data Modeling; **HW_04_Physical_Design Due**
- Apr 14: Object Oriented Data Modeling; **Release HW_05_Web_Application**

- Apr 19: Constraints
- Apr 21: Triggers

- Apr 26: Views
- Apr 28: Indexes

- May 03: HW_05 Presentation
- May 05: HW_05 Presentation; **HW_05_Web_Application Due**

- May 10: No Class

- **May 17: Final Exam (1:30 pm – 4:00 pm)**