CS 1555: Database Management Systems (Spring 2026)

Department of Computer Science, SCUPI

Course Reference Number: 312205030 (CS1555)

When: Spring 2026

What & Where:

Lectures, 8:15AM-11:00AM and 1:50PM-4:25PM on Wednesday @ S106, SCUPI Building, Jiang'an South Campus

Instructor: Dr. Guangwu Qian

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Web: https://scupi.scu.edu.cn/en/faculty-staff-en/faculty-en/guangwu-qian

Office hours: 4:30PM - 6:00PM on Tuesday and Wednesday,
10:00AM - 12:00PM and 2:00PM - 6:00PM on Monday

Teaching Assistant:

Section 1: Jiaxuan Liu (Kagamiritsuto@163.com)

Section 2: Ruijin Xue (2022141520223@stu.scu.edu.cn)

Course Description: This course covers fundamental concepts of database systems. These concepts include database modeling and design, relational databases, querying and SQL, query optimization, data storage, transactions, database system architectures, data mining and warehousing techniques, recovery, privacy, integrity, and security.

Course Objectives: This is not a purely practical nor a purely theoretical course. Successful students will effectively communicate understanding of concepts as well as demonstrate practical implementation of database design and programming.

Learning Outcomes: After completing this course, students will be able to:

- **Database Design:** Modeling data using entity-relationship diagrams and implementing normalized relational schemas.
- **SQL Mastery:** Proficiently writing SQL queries, views, and triggers for data manipulation and integrity.
- **Database Implementation:** Practical experience with commercial Database Management Systems (DBMS).
- **Database Internals:** Understanding file structures, indexing (B+ trees), query optimization, and transaction management.
- **Application Development:** Building database-backed applications, which may include using JDBC, Python/Flask, or other ORMs.

Prerequisites: The course CS1501 is required. Working knowledge of programming languages (Java preferred) and familiarity with Windows/Linux are assumed.

Blackboard: https://pibb.scu.edu.cn

All handouts, class notes and assignments will be published on Blackboard. You are expected to check this website frequently.

Textbook: *Fundamentals of Database Systems, 7th Edition.* Ramez Elmasri and Shamkant B. Navathe, Person, 2016

Note on Email & Communication: The instructor and TA will periodically post announcements to the Blackboard website. It is every student's responsibility to regularly monitor these announcements. The instructor and TA will periodically email enrolled students with announcements. Students must check their SCUPI email at least once per day to ensure these announcements are received. When contacting the course staff via email, messages must be addressed to (or CC) both the instructor and the TA. Email subject should be prefaced with the appropriate prefix (e.g., "[CS1501]").

Course Grading:

Ordinary Grade (Attendance, Questions, Assignments)	30%
Midterm Exam / Mini Project	20%
Final Exam	50%

Grading Policy:

Attendance and participation in lectures may be used to decide borderline grades.

Unless explicitly noted otherwise, the work on this course is to be done independently. Discussions with other students on the assignments should be limited to understanding the statement of the problems. Cheating in any way, including giving your work to someone else, will result in a low grade for the course and a report to the appropriate Institute/ University authority.

Submission & Late Policy: All written assignments must be submitted electronically and **there is no late submission**. An assignment which is late will be accepted *only* under special circumstances with the instructor's permission prior to its deadline. In such a case, the instructor will determine any penalty in a fair manner.

Make-up Policy: Students are expected to take both midterm and final exams. Make-up exams will only be given in the event of a medical situation or an emergency, and only if this is documented and the instructor is notified *immediately if in advance is not possible*. Missing an exam will result in a failure for the exam.

Students with Disabilities: If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and TA as early as possible in the term.

Religious Observance: In order to accommodate the observance of religious holidays, students should inform the instructor of any such days as early as possible in the term by email.

Audio/Video Recording: To ensure the free & open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

Copyrighted Material: All material provided through this web site is subject to copyright. This applies to class notes, slides, assignments, solutions, project descriptions, etc.

You are allowed (and expected!) to use all the material provided for personal use. However, you are strictly prohibited from sharing the material with others in general and from posting the material on the Web or other file sharing venues.

Outline: Tentative Lecture Schedule

1. Introduction to database concepts and architecture.
2. The relational data model.
3. The SQL database language.

4. The relational algebra

5. Conceptual database design using the Entity-Relationship model and Extended Entity-Relationship modeling, and mapping to relational model.

6. Database programming techniques.

7. File and index structures and search methods for database storage.

8. Introduction to relational database theory, functional dependencies, and normalization.

9. Introduction to database security.

10. Relational calculus.

References:

1) Oracle 9i Programming: A Primer, Rajshekhar Sunderraman, 2004.
2) SQL Antipatterns: Avoiding the Pitfalls of Database Programming (Pragmatic Programmers), Bill Karwin, 2017

Tentative Date of Final Exam: July 1, 2026 (Wednesday)