



蘇州大學
Soochow University

CS 348 Databases

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

This course focuses on the study of sophisticated database systems for Cloud and Big Data computing, encompassing research and practical applications. This course delves into Cloud Computing and Advanced Database Systems utilizing a popular cloud platform. It explores the internals of modern database management systems, dependency theory, normal forms in relational databases, and key principles of large-scale analytical systems (OLAP). Additionally, it addresses concerns of security, privacy, and social responsibility in data management.

Upon completion of this course, students will be able to:

1. Understand database management system architecture and implementation.
2. Explore concurrency control and recovery mechanisms.
3. Analyze query processing techniques and optimization strategies.
4. Learn querying graph databases.
5. Examine database applications and their development.
6. Comprehend Database Security Management.
7. Develop skills in database application system development.

PREREQUISITES

CS 112 Introduction to Databases II, CS 258 Data Structure and Algorithms

GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:



| ITEM | POINTS |
|-------------|------------|
| Quizzes | 15 Points |
| Assignments | 20 Points |
| Midterm | 15 Points |
| Project | 20 Points |
| Final Exam | 30 Points |
| Total | 100 Points |

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F.$$

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

Ramez Elmasri, Shamkant B. Navathe. (2010), *Fundamentals of Database Systems*, 6th edition, Pearson.

Recommended (Optional) Texts or Other Materials:

Michael R. Groh. (2010), *Access 2010 Bible*, Wiley.

Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom. *Database Systems: The Complete Book*, 2nd edition, Pearson.

COURSE TOPICS

| MODULE | TASKS |
|----------|--|
| Module 1 | Topics: Topic 1: Databases and Data Users. Topic 2: The Relational Data Model and Relational Database Constraint. Topic 3: More SQL: Complex Queries, Triggers, Views, and Schema Modification. Topic 4: The Relational Algebra and Relational Calculus. Assessments: Quiz#1 Assignment#1 |



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|----------|---|
| Module 2 | Topics: Topic 5: Data Modeling Using the Entity-Relationships Model. Topic 6: The Enhanced Entity-Relationships Model. Topic 7: Practical Database Design Methodology and Use of UML Diagrams. Topic 8: Object and Object-relation Databases. Assessments: Quiz#2 Assignment#2 |
| Module 3 | Topics: Topic 9: XML: Extensible Markup Language Topic 10: Introduction to SQL Programming Techniques. Topic 11: Web Database Programming Using PHP Topic 12: Algorithms for Query Processing and Optimization. Assessments: Midterm Project |
| Module 4 | Topics: Topic 13: Physical Database Design and Tuning. Topic 14: Introduction to Transaction Processing Concepts and Theory. Topic 15: Data Recovery Techniques. Topic 16: Data Security. Assessments: Quiz#3 Project due |
| Module 5 | Topics: Topic 17: Distributed Database. Topic 18: Enhance Data Models for Advanced Applications. Topic 19: Data Mining Concepts. Topic 20: Overview of Data Warehousing and OLAP Assessments: Final Exam |

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning



and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

LEARNING REQUIREMENTS

- 1) Late assignments are not acceptable and are subjected to grade deductions.
- 2) Assignments submitted in the wrong format will be counted as not submitted.
- 3) Failure to submit or fulfill any required course component results in failure of the class.
- 4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
- 5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACADEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.



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DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.