Fairfield University — CS 357 / SW 402

Course Syllabus for CS 357 / SW 402: *Database Management Systems*

Fall 2019

Time

6:30pm — 9:00pm on Tuesdays

Room

Bannow 166

Instructor

Name: Murray Patterson
Email: mpatterson@fairfield.edu
Office: Bannow 105

Office Hours

2:30pm — 4:00pm on Mondays and Thursdays, or by appointment

Textbook

Database Systems Concepts, *7th Edition*. Silberschatz, Korth and Sudarshan. McGraw-Hill, 2019.

ISBN: 978-0-07-802215-9 (bound edition); 978-1-260-51504-6 (loose leaf edition)

- low-cost eTextbook also available

Online Resource — https://www.db-book.com

Course Content

Fairfield University Blackboard — https://fairfield.blackboard.com/

Course Overview

Welcome to Fairfield University's CS 357 / SW 402! This course examines data management systems; relational database model; domains and relational integrity; structured query language (SQL); database design — logical and physical; entity-relationship diagrams; normalization; transaction processing; and database administration.

This course focuses on the steps required to build and maintain relational database infrastructure for modern applications. It covers logical and physical design; implementation of the database; the use of the database to meet the informational needs of a software system; and the installation, operation and maintenance of the software. Students perform a number of hands-on exercises using the Oracle Database Server running on the Microsoft Windows platform.

Prerequisite: CS 232.

Course Outcomes[1]

Students successfully obtaining credit in this course will have an ability to:

1. Approach a complex database specification task and to employ principles such as the entity-relationship model to identify design solutions. (Bloom's Taxonomy levels 1 & 4 — Knowledge & Analysis)

2. Design, implement, and evaluate a database system to meet a given set of requirements / specifications. (Bloom's Taxonomy levels 3 & 6 — Application & Evaluation)

3. Communicate effectively in a variety of real-world database management systems scenarios. (Bloom's Taxonomy level 2 — Comprehension)

4. Recognize professional responsibilities and make informed judgments in database design and implementation practice. (Bloom's Taxonomy levels 2 & 6 — Comprehension & Evaluation)

5. Function effectively as a member or leader of a team engaged in the design, implementation, testing and execution of a database systems solution. (Bloom's Taxonomy levels 3 & 6 — Application & Evaluation)

6. Apply theoretical background (data structures, the relational model, etc.) and software development fundamentals to produce database systems solutions. (Bloom's Taxonomy levels 3 & 5 — Application & Synthesis)

Course Structure

- **Lecture** — Classes will be conducted in traditional lecture format.

- **In-class exercises** — Hands on small scale tasks, *e.g.*, devising the correct SQL query, in class to initiate a working knowledge of current material. Professor will check your answers / test if your code is producing the correct results and grade the assignments.

- **Homework** — Weekly assignments building on the week's lecture content. Professor will check your answers / test if your code is producing the correct results and grade the assignments.

- **Readings** — Course textbook pages, relevant articles and additional supporting content will be assigned for students to read.

- **Discussions** — Opportunities to share questions about key concepts, homework assignments, and more.

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[1]https://tinyurl.com/y6myuceg

Course Project

An important part of this course is the course project, which will be assigned a few weeks into the course. The idea is that you will work in groups on designing, implementing, testing and ultimately demonstrating a fully functioning database system for a real-world scenario, *e.g.*, the Amazon company.

Final Exam

There will be a final exam in this course. The exam will involve some programming (SQL, etc.), and will cover the lectures, homework assignment, and readings.

Grade Scale

Grade	Numerical Value	Point Equivalent
A	4	93—100
A-	3.67	90—92
B+	3.33	87—89
B	3	83—86
B-	2.67	80—82
C+	2.33	77—79
C	2	73—76
C-	1.67	70—72
D	1	60—69
F	0	0—59

Grading

- Attendance / Participation / In-class Exercises (10%)
- Homework Assignments (35%)
- Course Project (35%)
- Final Exam (20%)

Course Schedule (*subject to change**)

	Topic	Reading
Week 1	Introduction to Database Systems	Ch. 1
Week 2	Introduction to the Relational Model	Ch. 2
Week 3	The Entity-Relationship (E-R) Model / **Course Project Assigned**	Ch. 6
Week 4	Introduction to SQL	Ch. 3
Week 5	Relational Database Design	Ch. 7
Week 6	Intermediate SQL	Ch. 4
Week 7	Advanced SQL	Ch. 5, § 5.1–5.3
Week 8	Complex Data Types	Ch. 8
Week 9	Database Application Development	Ch. 9
Week 10	Physical Storage Systems	Ch. 12
Week 11	Storage and File Structure	Ch. 13
Week 12	Indexing and Hashing	Ch. 14
Week 13	Query Processing	Ch. 15
Week 14	Transactions	Ch. 17

* for example, some chapters are much shorter / longer than others, and so their coverage may be continued to the next session, or brought into the previous session

Attendance Policy

As a student at Fairfield University, you are expected to attend every scheduled class session. Class attendance is important and will be taken by your instructor at the beginning of each lecture. Please inform the instructor in advance, preferably by e-mail, if you must be absent from a class. Excessive absences (as judged by the instructor) may lower your grade up to failing the class.

Classroom Participation

Students are expected to help promote the learning environment and respecting their classmates by being on-time and prepared for each class. During lectures, refrain from any unnecessary talk unrelated to the course material. In your own interest, while in class **DO NOT** use cell phones, Internet browsers, chats, or any computer software and tools for personal matters (*i.e.*, texting, checking emails, social media, paying bills, etc.). Any such activity will result in at least expelling the student from the class and being marked as absent for the lecture.

Missed Classes

Student are responsible for obtaining material distributed in class in days when she/he was absent. This can be done through contacting a classmate who was present, by contacting the instructor, or through the course website. There are no make-up exams unless the student missed the exam due to a pre-arranged, documented excused absence. Only official excuses will be accepted. **Any uncoordinated, unexcused missed exam will result in a score of zero for that exam**.

Late Assignments

Assignments are due at the beginning of class on the due date. Late submission will be assessed a penalty of 20% with no more than two days allowed.

Academic Integrity

Unless stated otherwise by your instructor, **individual work** is expected. Anything you turn in with your name on it must be your own work — that is, written or coded by you and not copied from anyone or anywhere else. If you use materials that you have obtained on the Internet, *e.g.*, `https://stackoverflow.com`, from a book, etc., you must include an appropriate reference. To use such materials without proper attribution is a form of plagiarism. Team projects must be original! By registering in this course, each one of you is explicitly agreeing to abide by and adhere to the Fairfield University agreement on academic integrity.

Academic Dishonesty

Cheating and other types of academic dishonesty in this course will result in a grade of zero for the project, paper, or examination in question, and may result in an F for the course itself. When appropriate, expulsion may be recommended. A notation of the event will be made in the student's file in the School of Engineering dean's office.

Students with Disabilities

Fairfield University School of Engineering complies with the American with Disabilities Act and Section 504 of the Rehabilitation Act. Any student who may require accommodation under such provisions should contact the Office of Accessibility Disability & Support Services.

Health and Well-being

Fairfield University provides mental health services to support the academic and personal success and well-being of students. Counseling & Psychological Services offers free, confidential psychological services to help students manage personal challenges that may interfere with your well-being. Fairfield University is committed to advancing the mental health and wellbeing of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services — by experienced, professional psychologists and counselors, who are attuned to the needs of college students — are available.

For more information contact `counseling@fairfield.edu` or by calling (203) 254-4000 ext 2146.

Course Withdrawal

There are deadlines for withdrawal during the semester. If you are thinking of withdrawing, timely action is necessary. Please check Fairfield University's policy on course withdrawals. Students who simply "drop out" of class, *i.e.*, stop showing up without formally withdrawing from the course will receive a grade of F for the course.

Any requests for special consideration relating to attendance, projects, examinations, etc., must be discussed with and approved by the instructor in advance. It is the student's responsibility to check any change in the due dates of the projects/home works, date of tests, etc. **You are required to observe the University and Departmental policies on academic honesty**.