Term: Spring 2026 **Subject:** Computer Science (CSE) **Number:** 412

Course Title: Database Systems (CSE 412)

Course Session

Days: T Th

Time: 12:00 PM – 1:15 PM

Location: Tempe – CDN60

Dates: 1/12/2026 - 5/1/2026 (C)

Instructor

Name: Bharatesh Chakravarthi, Ph.D.

Assistant Teaching Professor, CSE, SCAI

Office: BYENG M1-40

Email: bharatesh@asu.edu

Instructor Office Hours: Wednesday 1:30 – 3:00 PM.

Students can meet the instructor outside of office hours by scheduling an appointment via email. Include [CSE412] at the start of the subject's line.

Teaching Assistant:

Name: Kaustav Chanda

Email: kchanda3@asu.edu

Office Hours: To be updated.

UGTA:

Name: Tanvi Goyal

Email: tgoyal1@asu.edu

Office Hours: To be Updated

Course Prerequisite:

Course participants should have acquired basic computer science knowledge, including discrete mathematics, data structures, and algorithms. Course participants should also have acquired programming experience with a high-level programming language (e.g., C++, Java). It is strongly recommended that course participants have taken and passed CSE 205 and CSE 310.

Course Description:

This course is deemed an introduction to database systems. More importantly, this course will touch upon the following topics: database design/modeling, database applications development, data storage and indexing, query processing and optimization, transaction management, and database security.

Course Learning Outcome:

The ultimate goal of this introductory course is to master skills in data modeling and extract information stored in databases using existing database management systems. Course participants will learn definitions of terms and understand the DBMS ecosystem. By the end of this course, students should learn the following:

(1) Set up a database on a computer server.
(2) Design and create efficient relational data models that fit the database application needs.
(3) Loading data into the database.
(4) Write SQL (and other similar language for accessing, querying, and manipulating data) programs to issue queries over the database to read, edit, analyze, and summarize data.
(5) Build applications that access the database to retrieve relevant data and present it to end users.
(6) Understand relational algebra, relational calculus, functional dependency, query execution/optimization/compilation, etc.

Course Reading:

Will mainly use the following textbook.

“Database System Concepts”. (seventh edition) by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan (SKS).

Course Components:
(The topics listed below are for reference purposes and are subject to change with prior notice if applicable.)

This course places significant emphasis on hands-on practice with the PostgreSQL database tool for assignments, quizzes, the group project, and examinations. Students will engage in a combination of individual and collaborative assessments designed to develop both conceptual understanding and practical skills.

Assignments

- Four assignments will be given throughout the semester, each focusing on key database concepts and practical implementation. Topics include Entity-Relationship (ER) Modeling, SQL queries (ranging from basic to advanced complexity), View Creation, Access Control, Schema Normalization, Indexing, and developing a simple web-based database application. Each assignment will have a minimum completion period of two weeks, with firm submission deadlines administered online via canvas.

Quizzes

- Five quizzes will assess comprehension of concepts covered in lectures. Quizzes will include multiple-choice questions and SQL query writing tasks. All quizzes will be administered online through a lockdown browser to ensure exam integrity.

Group Project

- Students will work in teams of up to four members on a project divided into three phases. The project will involve the design and implementation of a database using PostgreSQL (any other tool), along with the development of an associated web/mobile application. The project emphasizes collaboration, problem-solving, and real-world application of course concepts. Submission will be over the canvas.

Midterm and Final Exams

- The midterm (2) and final exam (comprehensive) will consist of multiple-choice questions, SQL query writing, and short-answer descriptions. Exams will be conducted online via Canvas lockdown browser, with the scope and guidelines communicated during lectures. Please refer to the course shell for exam dates.

Through these components, students will demonstrate their understanding of database systems, strengthen their SQL proficiency, and showcase their ability to design and implement database-driven applications both individually and collaboratively.

Grading Policy

Evaluation Component	Weightage
Quizzes (5)	15%
Assignments (4)	30%
Group project (1)	25%
Midterm Exam (2)	20%
Final Exam (1)	10%

Grade	Upper limit percentage	Lower limit percentage
A+	100 %	to 97 %
A	< 97.0 %	to 94.0 %
A-	< 94.0 %	to 90.0 %
B	< 90.0 %	to 87.0 %
B+	< 87.0 %	to 84.0 %
B-	< 84.0 %	to 80.0 %
C+	< 80.0 %	to 76.0 %
C	< 76.0 %	to 70.0 %
D	< 70.0 %	to 60.0 %
E	< 60.0 %	

Course Policies – Assignments and Grading

- **Attendance and Participation**: It is highly recommended that you attend each in-person class session. When you attend, please arrive on time, attend the full class period, and participate in the class activities. It is fine that participants (students) may need to occasionally miss a class session for personal reasons (e.g., religious holidays, family matters). In these situations, the student must contact the instructor to discuss alternative ways to grasp the information presented in the missed class session before the next class
- **Late Submission Policy:** The due dates/times for all assignments are presented on the class schedule. Please note the dates/times carefully because there will be no provision for late submissions, except for extraordinary circumstances. Late submissions will receive no credit.
- **Makeup Exam Policy:** There will be no provision for make-up exams or assignments, except in extraordinary and documented circumstances.

Classroom Behavior Policy

- The students are required to behave courteously. The use of recording devices, without explicit permission, is not permitted during class. Any violent or threatening conduct concerning this class will be reported to the ASU Police Department and the Office of the Dean of Students.

Academic Integrity

- Students in this class must adhere to ASU's academic integrity policy, which can be found at https://provost.asu.edu/academic-integrity/policy. Students are responsible for reviewing this policy and understanding each of the areas in which academic dishonesty can occur. In addition, all engineering students are expected to adhere to the ASU Academic Integrity Honor Code. All academic integrity violations are reported to the Fulton Schools of Engineering Academic Integrity Office (AIO). The AIO maintains a record of all violations and has access to academic integrity violations committed in all other ASU colleges/schools. Specific academic integrity announcements for this class are:
    - You can discuss the assignments with other teams but all the submitted materials must be developed and prepared separately by the submitting student groups.
    - You should be able to explain and justify the materials you submit as a group.
    - Each team member should be able to describe their role in the submitted materials and show evidence for their work.
    - Recommend sanctions for these violations will be a 0 grade on the related deliverable and/or reporting the violation to the AIO for their decision.

Student Copyright Responsibilities

- Students must refrain from uploading to any course shell, discussion board, or website used by the course instructor or other course forum material that is not the student's original work, unless the student first complies with all applicable copyright laws; faculty members reserve the right to delete materials on the grounds of suspected copyright infringement.
- The contents of this course, including lectures and other instructional materials, are copyrighted materials. Students may not share outside the class, including uploading, selling, or distributing course content or notes taken during the conduct of the course. Any recording of class sessions is authorized only for the use of students enrolled in this course during their enrollment in this course. Recordings and excerpts of recordings may not be distributed to others. (see ACD 304–06, "Commercial Note Taking Services" and ABOR Policy 5-308 F.14 for more information).

Harassment and Sexual Discrimination

- Arizona State University is committed to providing an environment free of discrimination, harassment, or retaliation for the entire university community, including all students, faculty members, staff employees, and guests. ASU expressly prohibits discrimination, harassment, and retaliation by employees, students, contractors, or agents of the university based on any protected status: race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, and genetic information.
- Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at https://sexualviolenceprevention.asu.edu/faqs.
- As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, https://eoss.asu.edu/counseling is available if you wish to discuss any concerns confidentially and privately. ASU online students may access 360 Life services at https://goto.asuonline.asu.edu/success/online-resources.html.

Change Notice

- Any information in this syllabus may be subject to change with reasonable advance notice.

Other Information

- If the instructor is absent from a class without prior notice, the students can leave after 15 min. Students may be directed to wait longer by someone from the academic unit if they know the instructor will arrive shortly