



Term: Fall 2026 **Subject:** Computer Science & Engineering (CSE) **Number:** 512

Course Title: Distributed Database Systems (CSE 512)

Course Session

Days: Wednesday

Time: 4:30 PM – 7:15 PM

Location: Tempe - BYAC270

Dates: 8/20/2026 – 12/04/2026

Instructor

Name: [Bharatesh Chakravarthi, Ph.D.](#)

Assistant Teaching Professor, CSE, SCAI

Office: BYENG M1-40 / [Zoom Personal Meeting Room](#)

Email: bharatesh@asu.edu

Office Hours: Thursday 12:00– 1:00 PM; Students can meet the instructor outside of office hours by scheduling an appointment via email. Include [**CSE512**] at the start of the subject's line.

Grader

Name: Pruthvi Nandan Janga

Email: pjanga@asu.edu

No office Hours – All communication via email only with the Instructor and TA in the loop

Course Description

Distributed Database Systems (DDS) is a 3-credit course that offers a comprehensive exploration of managing data across interconnected databases. Includes topics such as distributed database architecture, design, parallel query processing and optimization, transaction management, concurrency control, deadlocks, and fault-tolerant mechanisms. Additionally, the course may explore modern database management in

cloud computing environments, Map/Reduce-based systems, and distributed NoSQL database systems such as Apache Cassandra/MongoDB/Apache HBase/Couchbase. The course emphasizes interactive learning through in-class discussions, requiring students to come prepared after doing the necessary readings. Practical assignments/exercises and projects complement theoretical knowledge, enabling students to develop expertise in designing and managing distributed databases. By the course's end, students gain valuable skills applicable to data management, cloud computing, and related fields, equipped to tackle challenges in large-scale distributed data systems.

Enrollment Requirements

Prerequisite(s): Computer Engineering or Computer Science or Data Science, Analytics & Engineering or Global Management (Data Science) or Robotics & Autonomous Systems (AI) or Software Engineering grad student; Credit allowed for only CSE 511 or CSE 512

For maximum effectiveness, Students are expected to have a foundational understanding of database systems, acquired through previous courses like CSE 412 and/or CSE 510. This includes familiarity with SQL query language, query processing, optimization, data storage, indexing, and transaction management concepts. Additionally, students should possess programming experience in high-level languages like C++, Java, and/or scripting languages such as Python. This background will enable students to engage effectively in the course material and practical assignments/projects.

Course Components

- **Assignments and In-class activities:** Throughout the course, students will be required to complete three individual assignments and ten homework/in-class activities. These components will include programming-based problem statements and research-based exploration studies related to recent advancements in distributed database systems. Each assignment will be allotted a three-week time limit for completion.
- **Group Projects:** There will be one group project during the course, and each team can have a maximum of four members. A pool of project topics will be provided, and students can choose their preferred topic. The implementation platform, tools, and programming languages are open for student selection. For project submission, students must create a 3-minute video demonstrating their project implementation, an 8 to 10-page report describing the project, and the source code.

- **Midterm Exam:** The midterm exam will be conducted using a lockdown browser, and it will include multiple-choice questions in a quiz format, along with a programming question that must be solved within a fixed duration.
- **Final Exam:** The final exam will also be conducted using a lockdown browser and will consist of multiple-choice questions in a quiz format.
- **Quizzes:** Five scheduled quizzes will be offered online with a 24 hours' time window to attempt with a lockdown browser.

Note: Wi-Fi: You must have access to Wi-Fi that allows you to properly complete all course assignments, exams and other requirements.

By following these assessment components, students will have opportunities to demonstrate their understanding of distributed database systems and showcase their skills through individual assignments and collaborative group projects.

Grading Policy

Evaluation Component	Weightage
In-Class Activity / Homework	20%
Assignments (3)	30%
Group projects (1)	25%
Quizzes (5)	05%
Midterm Exam	10%
Final Exam	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 Plan

It is strongly recommended that students regularly visit the Canvas course page for any updates or modifications concerning assignments, In-class activities, quizzes, and group project schedules, as well as submission deadlines. The topics listed below are for reference purposes and are subject to change.

Course Plan CSE 512 – Distributed Database Systems Fall 2026				
Week (W)	Date	Lecture Topic	ICA/A/Q	Group Project
W 01	8/26	Introduction to distributed database systems, architecture, and design principles.	ICA1	
W 02	9/02	Hands-on Session	ICA2	Project Team Finalization
W 03	9/09	Data fragmentation & replication.	ICA3 A01 Release	
W 04	9/16	Distributed query processing and optimization, Parallel query processing.	ICA4/Q1	Project Topics Pool Release
W 05	9/23	Data management in map-reduction systems.		Project Topic Finalization
W 06	09/30	Distributed transaction management – concurrency control.	ICA5 A01 Submission / A02 Release / Q2	
W 07	10/07	Midterm Exam		Project Synopsis Submission
W 08	10/14	Distributed database reliability and fault tolerance.	ICA6	
W 09	10/21	Hands-on Session	A02 Submission	
W 10	10/28	Replicated data management	A03 Release / Q3	
W 11	11/04	Big data systems, Data management in cloud computing environments.	ICA7 & ICA8 Q4	
W 12	11/11	Veteran's Day – Class Excused		
W 13	11/18	Data management in blockchain.	ICA9 A03 Submission	
W 14	11/25	Distributed NoSQL database systems.	ICA10 / Q5	Final Project Submission
W 15	12/02	Final Exam		

* ICA – In class Activity / Homework, A – Assignment, Q – Quiz.

Course Policies – Assignments and Grading

- **Attendance and Participation:** It is highly recommended that you attend each 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.

Policy against threatening behavior, per the Student Services Manual, SSM 104–02

- Students, faculty, staff, and other individuals do not have an unqualified right of access to university grounds, property, or services (see SSM 104-02). Interfering with the peaceful conduct of university-related business or activities or remaining on campus grounds after a request to leave may be considered a crime. All incidents and allegations of violent or threatening conduct by an ASU student (whether on- or off-campus) must be reported to the ASU Police Department (ASU PD) 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.
- Students in this class are expected to acknowledge and embrace the FSE student professionalism expectation located at: <https://engineering.asu.edu/professionalism/>

Generative AI

- Generative AI is a technology that can often be useful in helping students learn the theories and concepts in this course. However, unless explicitly allowed by your instructor, the use of generative AI tools to complete any portion of a course assignment or exam will be considered academic dishonesty and a violation of the ASU Academic Integrity Policy. Students confirmed to be engaging in non-allowable use of generative AI will be sanctioned according to the academic integrity policy and FSE sanctioning guidelines.

Student Copyright Responsibilities

- Student 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).

Disability Accommodations

- Suitable accommodations are made for students having disabilities. Students needing accommodation must register with the ASU Student Accessibility and Inclusive Learning Services office and provide documentation of that registration to the instructor. Students should communicate the need for an accommodation in enough time for it to be properly arranged. See ACD 304-08 Classroom and Testing Accommodations for Students with Disabilities.

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>.

Photo requirement

- Arizona State University requires each enrolled student and university employee to have on file with ASU a current photo that meets ASU's requirements (your "Photo"). ASU uses your Photo to identify you, as necessary, to provide you educational and related services as an enrolled student at ASU. If you do not have an acceptable Photo on file with ASU, or if you do not consent to the use of your

photo, access to ASU resources, including access to course material or grades (online or in person) may be negatively affected, withheld or denied.

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