Prince Sultan University
College of Computer and Info Sciences / Department of Computer Science
Term 252
2nd Semester 2025 - 2026

COURSE SYLLABUS

1. Mission Statement of the Bachelor of Computer Science Program(s): Provide high quality, computer science education to prepare top graduates through an environment that promotes innovative thinking, ethical behavior, lifelong learning, research, and service to the community
2. Course number and name: CS435 Distributed System
3. Credits and contact hours: 3 credits and 4 contact hours (Lectures: 3 Tutorials: 1)
4. Instructor's or course coordinator's name: Prof. Basit Qureshi and Dr. Siwar Rekik
   - Scheduled Office Hours: posted on office door
   - Office Location: 2B 20 Building 105
   - Email: qureshi@psu.edu.sa
5. Text book, title, author, and year
   - Primary Text: [ST] Distributed Systems by Maarten van Steen and Andrew Tanenbaum; CreateSpace Independent Publishing Platform; 4th edition (February, 2024); ISBN: 978-9081540636
   - Other References: [CD] Distributed Systems: Concepts and Design, 5th Ed. by George Coulouris, Jean Dollimore, Tim Kindberg, Gordon Blair, Pearson ISBN-13: 978-0132143011
   - Course Website: https://www.ieeepsu.org/basit/cs435
   - Learning Management System: Moodle available at https://lms.psu.edu.sa

5. Specific course information
   a. Brief description of the content of the course (catalog description): This course introduces students to distributed and parallel systems. It discusses the design & organization of distributed systems and architectures. Topics include Parallel processing, multithreaded programming, distributed systems communication models, socket programming, RPC/RMI, and MapReduce programming model. Distributed systems core concepts such as process coordination, clocks & synchronization, dist transactions, data consistency, concurrency control, consensus, replication, fault tolerance, dist file systems, and security are also covered. Students apply knowledge and methods of parallel and distributed systems to analyze the performance of popular distributed system(s).

   b. Prerequisites or co-requisites: CS330 Operating Systems and CS331 Comp. Networks
   c. Indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required for CS. Elective for SE and IS.
6. Specific goals for the course
   a. Specific outcomes of instruction.
   At the end of the course, the student will be able to:
   CLO1: Demonstrate core principles, architectures, and programming models in distributed systems.
   CLO2: Evaluate various techniques and algorithms for distributed & parallel processing and communication.

CLO3: Analyze the effectiveness of synchronization, consistency, consensus, replication, and fault tolerance techniques.
CLO4: Evaluate Distributed File systems and security issues.
CLO5: Evaluate the performance of popular distributed system(s).

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course. The course addresses ABET CS-SOs 1 and 2.

Course LOs #	Student Outcomes (SOs)
	Computer Science
1	SO 1
2	SO 1
3	SO 1
4	SO 1
5	SO 6

7. Brief list of topics to be covered

Week No.	Topics	CLO(s) alignment	Assessments
1-2	Intro to Distributed Systems	1	Quiz1
3-5	Parallel Processing	1, 2	Assignment1
6-7	Communication in Dist Systems	2	Assignment2
8-9	Apache Hadoop	5	Midterm Exam
10-11	Fault Tolerance, Replication, Synchronization	3	Course Project
12-13	Dist Mutual Exclusion, Dist. Transactions, Consistency	3	Quiz2
14-15	Dist File Systems, Dist syst. Security	4, 5	Coursera Module

8. Weight of Assessments

Assessment	Assessment Task	Week Due	Proportion of Final Assessment
1	Midterm Exam	Week 8	20%
2	Guided Course Project	Week 11	15%
3	2x Programming Assignments	Week 4, and 7	8%
4	2x Quizzes	Week 3 and Week 13	8%

5	Coursera Module	Wednesdays of weeks 9 to 15	4%
6	Attendance		5%
7	Final Exam	At the end of the semester	40%

9. Additional Information

Plagiarism and Academic Dishonesty: "Plagiarism can be defined as unintentionally or deliberately using another person's writing or ideas as though they are one's own. Plagiarism includes, but is not limited to, copying another individual's work and taking credit for it, paraphrasing information from a source without proper documentation, and mixing one's own words with those of another author without attribution. In addition, buying a work or project, or downloading a work from the Internet, and submitting them as your own are also plagiarism. **The penalty for academic dishonesty will bring course expulsion and failure, or even suspension"** (Academic Integrity and Syllabus Acknowledgement Form).

Ethical and Responsible Use of Generative AI: are encouraged to use Gen-AI tools to enhance learning, teaching, and innovation, provided that such use:

- Is explicitly disclosed and acknowledged;
- Is subject to critical human review and validation;
- Fully complies with PSU's standards for academic integrity, ethical conduct, and legal requirements.

Unauthorized or unethical use of Gen-AI tools may constitute academic misconduct and will be subject to appropriate disciplinary actions in accordance to PSU's regulations

Attendance Policies: The University attendance policy will be strictly followed. Students are expected to attend all class sessions and be in class on-time. Missing a class session is a student's responsibility. Missed classes will not be repeated. A total of **16** absences ends in a denial grade DN. **Once the DN is issued, it cannot be reverted.** It is the student's responsibility to periodically check course website/Moodle for course content, projects assignments, updates and notifications. The CCIS additionally has penalties for missed classes as follows.

No of absences	4	7	10	13	15
Reduced score	1	2	3	4	5

Exam Policies: Midterm and the Final exam is unified among all sections and their dates are announced from the onset of the semester. It is not possible to reschedule any major exam. Makeup exam will only be approved in limited cases as stipulated in the university bylaws. Generally, the final exam includes all material covered during the semester (comprehensive).

Assignment/Project Policies: Students are expected to actively participate in class discussion and activities. Late assignments are not accepted. It is the student's responsibility to check/test/verify/debug the code before submission. It is the student's responsibility to verify that all files have been uploaded to the LMS. After an assignment/project has been graded, re-submission with an intention to improve an assignments scores will not be allowed.