CSE 6332: Cloud Computing & Big Data

Fall 2025

As the instructor for this course, I reserve the right to adjust the syllabus and schedule in any way that serves the educational needs of the students enrolled in this course. – Zaman Noor, PhD

Instructor Information

Name

Zaman Noor, PhD

Office Location

ERB 402

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Faculty Profile

Zaman Noor (https://www.uta.edu/academics/faculty/profile?username=noorm)

Office Hours

Tuesday, Thursday, 2:00-3:00 PM at ERB 402

Communication Guidelines

My preferred communication method is email. I will respond to emails within two business days.

Course Information

Section Information

CSE 6332-003

Course Description

Course Title: Cloud Computing & Big Data

The focus of this course is on data management techniques and tools for storing and analyzing very large volumes of data. Topics include cloud computing; virtualization; distributed file systems; large data processing using Map-Reduce; data modeling, storage, indexing, and query processing for big data; key-value storage systems, columnar databases, NoSQL systems; big data technologies and tools; large-scale stream processing systems; data analytics frameworks; big data applications, including graph processing, recommendation systems, and machine learning.

Prerequisites: None

Course Delivery Method

This course is designated as ON-CAMPUS, which means the majority of course instruction, exams and projects delivered on-campus or at designated instructional sites, in-person.

Time and Place of Class Meetings

SEIR 198, Tuesday, Thursday 3:30-6:20 PM

Time Zone

This course operates on Central Time. All times listed for class meeting times, exams, and assignment deadlines are in Central Time (CT).

Classroom/Lecture Recording Policy

Faculty maintain the academic right to determine whether students are permitted to record classroom and online lectures. Recordings of classroom lectures, if permitted by the instructor or pursuant to an ADA accommodation, may only be used for academic purposes related to the specific course. They may not be used for commercial purposes or shared with non-course participants except in connection with a legal proceeding.

Recording of classroom and online lectures in this course is allowed.

Expectations for Out-of-Class Study

Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional six hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

Student Learning Outcomes

By the end of this course, you will be able to:

1. Analyze and evaluate practical aspects of Big Data processing systems.
2. Solve linear algebra and machine learning problems using scalable computing frameworks such as Hadoop and Spark.
3. Design and implement efficient and scalable data processing solutions on current and next-generation platforms.

Course Materials & Technology

Textbook Information

There is no required textbook for this course. Students are expected to study the lecture notes and the references provided within them.

Recommended Textbooks:

- Hadoop: The Definitive Guide by Tom White, O'Reilly Media, $25
- High Performance Spark by Holden Karau & Rachel Warren, O'Reilly Media, $37

Technology & Equipment Requirements

Canvas, a desktop/laptop. Visit the OIT Services page for a list of Applications and Software available through UTA. Visit the UTA Libraries Technology page for a list of items that can be checked out or used at the library.

Assignments & Exams

Assignment 1: Linear Algebra on Hadoop

Students will implement a distributed linear algebra algorithm using Hadoop MapReduce. Evaluation: Functionality of each part.

Assignment 2: Linear Algebra on Spark

Students will implement a distributed linear algebra algorithm using Spark RDDs. Evaluation: Functionality of each part.

Assignment 3: Large-Scale Machine Learning on Spark

Students will implement a large-scale machine learning algorithm using Spark DataFrames. Evaluation: Functionality of each part.

Exam 1

Students will write MapReduce pseudocode to solve given problems. Evaluation: Graded on correctness.

Exam 2

Students will write Spark Scala code using RDDs to solve given problems. Evaluation: Graded on correctness.

Exam 3

Students will write Spark DataFrames code to solve given problems and design scalable solutions for a given machine learning problem. Evaluation: Graded on soundness of proposed solutions, and correctness.

Grading Information

Assignment Categories	SLO	Value (%)
Assignment 1	2	20%
Assignment 2	2	25%
Assignment 3	2	25%
Exam 1	1, 2	10%
Exam 2	2	10%
Exam 3	2, 3	10%
		Total: 100%

Students are expected to track their performance throughout the semester, which Canvas facilitates, and seek guidance from available sources, including the instructor, if their performance drops below satisfactory levels. Refer to the Student Support Services section below.

Final Grade Calculations

Earned pts Range	Letter Grade
>=89.5	A
>= 79.5 & < 89.5	B
>= 69.5 & < 79.5	C
>= 59.5 & < 69.5	D
< 59.5	F

Late Work Policy

Assignments submitted after the deadline will incur a penalty of 20 points per day. Extensions will only be considered in cases of unavoidable circumstances (e.g., health issues), and students must submit a doctor's note to the instructor.

Make-Up Exams Policy

Students who miss an exam due to unavoidable circumstances (e.g., health issues) must notify the instructor by email as soon as possible and provide a doctor's note to arrange a makeup exam.

Extra Credit Policy

Extra credit may be available throughout the semester at the instructor's discretion.

Grades and Feedback Timeline

Grades will be posted within four business days. Students may review their exams and assignments first with the TA during office hours, and then with the instructor if needed. Reviews must be completed within one week after grades are posted.

Grade Grievance Policy

Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current University Catalog: Grades and Grading Policies.

Course & University Policies

Attendance Policy

Students should review the University Class Attendance Policies on the Class Attendance Policies page. The following attendance policy will be applied in this course. Attendance will be recorded at every class session. However, attendance is not mandatory.

Generative AI Use in This Course

The use of Generative AI (GenAI) in course assignments and assessments must align with the guidelines established by the instructor. Unauthorized use of GenAI could result in breaches of academic integrity. Instructors are responsible for clearly delineating the permissible uses of GenAI in their courses, underscoring the importance of responsible and ethical application of these tools.

Community Standards within the Office of the Dean of Students articulate the university's stance on academic integrity and scholastic dishonesty. These standards extend to the use of GenAI. Unauthorized or unapproved use of GenAI in academic work falls within the scope of these policies and will be subject to the same disciplinary procedures.

As the instructor for this course, I have adopted the following policy on student use of GenAI: **Prohibition of GenAI Use**. Any suspected use of GenAI in the submitted work will be reported to the Office of Community Standards.

Institutional Policies

UTA students should review the University Catalog and the Syllabus Institutional Policies page for institutional policies and contact the specific office with any questions. The institutional information includes the following policies, among others:

- Drop Policy
- Disability Accommodations
- Academic Integrity
- Electronic Communication

UTA Honor Code

UTA students are expected to adhere to and observe standards of conduct compatible with the University's functions as an educational institution and live by the University of Texas at Arlington's Honor Code. It is the policy of The University of Texas at Arlington to uphold and support standards of personal honesty and integrity for all students consistent with the goals of a community of scholars and students seeking knowledge and responsibility.

Student Support Services

Academic Success Center

The Academic Success Center (ASC) offers a range of resources and services designed to help you maximize your learning and achieve academic success as a student at the University of Texas at Arlington. ASC services include supplemental instruction, peer-led team learning, tutoring, mentoring, and TRIO SSS. Academic Success Center services are provided at no additional cost to UTA students. For additional information, visit the ASC website or submit a tutoring request form.

The English Writing Center (411LIBR)

The Writing Center offers FREE tutoring in 15-, 30-, 45-, and 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Register and make appointments online at the Writing Center. Classroom visits, workshops, and specialized services for graduate students and faculty are also available. Please see Writing Center: OWL for detailed information on all our programs and services.

Academic Plaza

The Library's 2nd floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA, and various college/school advising hours. Services are available during the library's hours of operation.

UTA Health and Wellbeing Resources

UT Arlington is committed to the safety, success, and well-being of our students. To support our community, UTA has established a Community Advocacy, Response, and Engagement (CARE) Team, a dedicated group of campus professionals responsible for helping students who could benefit from academic, emotional, or psychological support, as well as those presenting risks to the health or safety of the community. If you know of someone experiencing challenges, appearing distressed, needing resources, or causing a significant disruption to the UTA community, please submit a CARE Referral by visiting the CARE Team page. You may also submit a referral for yourself if you would like additional support.

UTA students also have access to virtual, on-demand emotional support, appointment-based counseling, advanced psychiatric care, and more. For more information, visit TimelyCare.

NOTE: If a person's behavior poses an immediate threat to you or someone else, contact UTA Police at 817-272-3003 or dial 911. If you or someone you know needs to speak with a crisis counselor, please reach out to the MAVS TALK 24-hour Crisis Line at 817-272-8255 or the National Suicide and Crisis Lifeline at 988.

Student Services Page

The Student Services page provides links to many resources available to UTA students, including:

- Academic Success
- Counseling and Psychological Services (CAPS)
- Health Services
- Students with Disabilities
- Veteran Services

Students are also encouraged to check out Career Center resources to enhance their career-readiness, find student employment, search for internships, and more. We encourage Major Exploration and the use of Experiential Major Maps to keep students on track for graduation. Refer to the Graduation Help Desk for more details.

Accessibility of Course Materials

Some course materials, such as PDFs of musical scores, technical drawings, graphs, blueprints, design plans, or artworks (common in fields like drawing, painting, or construction drafting), may not fully comply with all Web Content Accessibility Guidelines (WCAG) requirements.

The University of Texas at Arlington is dedicated to ensuring all students have equal access to information. If you experience any accessibility barriers with course materials, please know that accommodations are available. You can get assistance through the Student Access and Resource (SAR) Center or by contacting your instructor directly. Please don't hesitate to reach out if you need help.

Online Academic Success Guide

Visit the Online Academic Success Guide to explore a list of helpful tips and resources to help you succeed in your online journey.

Librarian to Contact

Each academic unit has access to Librarians by Academic Subject who can assist students with research projects, tutorials on plagiarism, citation references, as well as support with databases and course reserves.

Safety Information and Resources

MavAlert System

The MavAlert system sends information to cell phones or email accounts of subscribed users in case of an emergency. Anyone can subscribe to MavAlerts at Emergency Communication System.

Emergency Phone Numbers

In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone) or **2-3003** (campus phone). You may also dial 911. The non-emergency number is 817-272-3381.

Course Schedule

Week and Dates	Topics	Assignments Due
Week 1 10/14	Introduction	
Week 1 10/16	MapReduce: Programming Model	
Week 2 10/21	Hadoop, HDFS	
Week 2 10/23	MapReduce: Design Pattern	Assignment 1
Week 3 10/28	**Exam 1**	
Week 3 10/30	Spark Scala	
Week 4 11/4	Spark Programming	
Week 4 11/6	Spark Fine Tuning	
Week 5 11/11	Spark Applications	Assignment 2
Week 5 11/13	**Exam 2**	
Week 6 11/18	Spark SQL Programming	
Week 6 11/20	Large Scale ML: Linear Regression	
Week 7 11/25	Spark SQL Fine Tuning	Assignment 3
Week 7 11/27	Thanksgiving Holiday	
Week 8 12/2	**Exam 3**	