

CSCI 4851 - Data Science and Machine Learning

Fall 2026 Syllabus, Section 01, CRN 43255,

Credit hours: 3

Instructor

Zack While

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Public Instructor Information

Instructor Title: Assistant Professor

Instructor Professional Qualifications:

- PhD, Computer Science, *University of Massachusetts Amherst* (2025)
- MS, Computer Science, *University of Massachusetts Amherst* (2022)
- BS, Computer Science & Mathematics, *Youngstown State University* (2018)

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Course Description

4851. Data Science and Machine Learning. Basic methodologies for the data science pipeline: data acquisition and cleaning, handling missing data, exploratory data analysis, visualization, feature engineering, modeling, interpretation, and presentation in the context of real-world datasets. Classical models and techniques for classification, clustering, anomaly detection, deep learning, and collaborative filtering. Prereq.: CSIS 3722 with a grade of C or better. Cross-Listed: CSCI 6951. 3 s.h.

Course Readings

Group	Title	Author	ISBN
Required	Data Science from Scratch: First Principles with Python (2e)	Joel Grus	9781492041139

Available for free online via Maag Library and O'Reilly.

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

Tentative Course Schedule

Week of	Reading(s)	Proposed Topic	Due/To Prepare for Class
8/24	Chapter 1 Chapter 2	Introduction to Data Science Crash Course in Python	
8/31	Chapter 4 Chapter 5 Chapter 6 Chapter 7	Theoretical Background	Quiz 1 Homework 0
9/7	Chapter 3	Data Visualization	Quiz 2
9/14	Chapter 9	Getting Data	Quiz 3 Homework 1



9/21	Chapter 10 Chapter 26	Working with Data Data Ethics	Quiz 4
9/28		Exam 1 Review	Quiz 5 Exam 1
10/5	Chapter 11	Machine Learning Concepts	Homework 2
10/12	Chapter 12 Chapter 17	K-Nearest Neighbors Decision Trees	Quiz 6 Project Proposal
10/19	Chapter 13	Naïve Bayes	Quiz 7 Homework 3
10/26	Chapter 20 Chapter 23	Clustering Recommender Systems	Quiz 8
11/2		Exam 2 Review	Quiz 9
11/9	Chapter 14	Simple Linear Regression	Homework 4
11/16	Chapter 15 Chapter 16	Multiple Regression Logistic Regression	Project Poster Homework 5 Project Code
11/23	Chapter 8	Gradient Descent	Quiz 11
11/30	Chapter 18	Neural Networks	Quiz 12 Poster Presentation Poster Session
12/7			Quiz 13 Exam 3

The course schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better learning.