Technical Elective – Data Analytics
Syllabus
Spring 2025

Instructor: Prof. Yang Liu
Credit Hours: 3
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Office Hours: Tuesday and Wednesday, 1:30 PM - 5:30 PM, or by appointment
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Lectures

Thursday, 1:50 PM - 5:30 PM
S106, SCUPI Building

Textbook Han, Kamber, Pei, *Data Mining: Concepts and Techniques*, 3rd Edition, Morgan Kaufmann.

Course Description

This course is an introductory course which provides an overview of data analytics. Specific topics include data preprocessing, data visualization, data warehousing, mining frequent patterns, classification, cluster analysis.

Course Objectives

1. Students will have knowledge of data mining.
2. Students will have the ability to apply data analytics skill to solve real-world problems in different industries.
3. Students will be able to use SAS, R, Python, SQL and Tableau.

Learning Outcomes

(a) An ability to apply knowledge of mathematics, science, and engineering
(b) An ability to analyze and interpret data
(c) An ability to identify, formulate, and solve engineering problems
(d) An ability to use the techniques, skills, and modern engineering

tools necessary for engineering practice

Pre-requisites IE 1070, MATH 0280

Grading

Mid-term Exam	20%
Final Exam	35%
Project	20%
Homework	15%
Quiz	10%

Final grades:

Level	Letter Grade	Reported Numerical Score	Grade Points
Superior Performance	A	90 - 100	4.0
	A-	85 - 89	3.7
Meritorious Performance	B+	80 - 84	3.3
	B	76 - 79	3.0
	B-	73 - 75	2.7
Adequate Performance	C+	70 - 72	2.3
	C	66 - 69	2.0
	C-	63 - 65	1.7
Minimal Performance	D+	61 - 62	1.3
	D	60	1.0
Insufficient Performance (Failure)	F	< 60	0.0

Course Policies:

- Students are expected to come prepared for each lecture by reading the appropriate material prior to class
- Questions concerning the grading of homework assignments, project-related materials, or exams must be presented to the instructor or the TA within one week (7 calendar days) after the materials have been made available for return to the student
- Late assignments will **NOT** be accepted, and all assignments, projects, and examinations must be **completed/taken at the scheduled time**. No exceptions will be made unless there are truly extenuating circumstances
- Cheating or academic dishonesty in any form will result in a grade of F for the course; there will be no exceptions to this policy.
- Professional classroom demeanor is required; in particular, all cell phones and personal electronic devices must remain off or silent during the lecture.
- Do not conduct side conversations during the lecture as it is distracting to the lecturer and other students.

Email Policy Email will be responded as promptly as possible. For detailed technical questions, please talk to the instructor during office hour.

Project

The project is designed to apply data mining, data visualization techniques to solve real-world problems. Detail description of the project will be provided during class. Project will be team-based. Evaluation of the project will be based on both the presentation and the written report.

Audio-Video Recording

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussions, and activities without the advance written permission of the instructor, and any such recording properly approved in advance should be used solely for the student's private use.

Make-up exam Policy

Make-up exam grading is only to replace your final exam grading. Students who pass the course after the make-up exam will receive only a passing grade as the final grade.

Special Accommodations

If the student has a disability for which the student is or may be requesting an accommodation, the student is encouraged to contact the instructor.

Tentative Schedule

Week 1: Introduction to data analytics
Week 2: Introduction to analytics software SAS
Week 3: Data mining
Week 4: Know your data
Week 5: Data preprocessing
Week 6: Mid-term Exam (4/3)
Week 7: Introduction to data visualization software Tableau
Week 8: Data warehousing and OLAP
Week 9: Mining frequent patterns
Week 10: Classification
Week 11: Cluster analysis
Week 12: Project presentation
Week 13: Final Exam (5/22)