

Course Information Sheet

CSCI 4380

Data Mining

Brief Course Description

The course aims to provide students with a broad introduction to the field of Data Mining and related areas and to teach students how to apply these methods to solve problems in complex domains.

Extended Course Description / Comment

The course aims to provide students with a broad introduction to the field of Data Mining and related areas and to teach students how to apply these methods to solve problems in complex domains

The course is appropriate both for students preparing for research in Data Mining and Machine Learning, as well as Bioinformatics, Science and Engineering students who want to apply Data Mining techniques to solve problems in their fields of study

Pre-Requisites and/or Co-Requisites

Prerequisite: CSCI 2720 (Data Structures) OR CSCI 2725 (Data Structures for Data Science)

Approved Textbooks

(If more than one, course text used during a semester is at the discretion of the instructor)

Author(s): Ian Witten, Eibe Frank & Mark Hall

Title: Data Mining: Practical Machine Learning Tools and Techniques

Edition: Third Edition, 2011

ISBN-13: 978-0123748560

Specific Learning Outcomes

(Performance Indicators)

These are a (non-exhaustive) list of specific, measurable outcomes, as they relate to the course & program objectives.

These learning outcomes should avoid using ambiguous language such as "understand" or "familiar".

Performance indicators must include an action verb (identifying the depth to which students should demonstrate performance), and the content referent that is the focus of the instruction (from ABET)

This course presents a survey of topics in data mining. At the end of the semester, all students will be able to do the following:

1. Analyze a real-world data set and identify appropriate data mining techniques to apply thereto.
2. Write a program or use a package to implement a data mining algorithm.
3. Conduct data mining experiments and properly report and discuss the results.
4. Effectively present a data mining article to an audience.
5. Review and critique data mining articles.

Target number 5 - 10

ABET Learning Outcomes

- A. Graduates of the program will have an ability to: Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- B. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- C. Communicate effectively in a variety of professional contexts.
- D. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- E. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- F. Apply computer science theory and software development fundamentals to produce computing-based solutions.

Relationship Between Student Outcomes and Learning Outcomes

Specific Learning Outcomes	ABET Learning Outcomes					
	A	B	C	D	E	F
1	•					
2	•	•				
3	•	•			•	•
4	•		•			
5	•			•		

Major Topics Covered

(Approximate Course Hours)

3 credit hours = 37.5 contact hours

4 credit hours = 50 contact hours

Note: Exams count as a major topic covered

Introduction (5-hours)

Input: Concepts, instances, attributes (5-hours)

Output: Knowledge representation (5-hours)

Algorithms: The basic methods (7.5-hours)

Credibility: Evaluating what's been learned (5-hours)

Implementations: Real machine learning schemes (7.5-hours)

Data Transformations (2.55-hours)

Ensemble Learning (2.5-hours)

Paper Presentations (10-hours)

Assessment Plan for This Course

Each time this course is offered, the class is initially informed of the Course Outcomes listed in this document, and they are included in the syllabus. At the end of the semester, an anonymous survey is administered to the class where each student is asked to rate how well the outcome was achieved. The choices provided use a 5-point Likert scale containing the following options: Strongly agree, Agree, neither agree or disagree, disagree, and strongly disagree. The results of the anonymous survey are tabulated and results returned to the instructor of the course.

The course instructor takes the results of the survey, combined with sample student responses to homework and final exam questions corresponding to course outcomes, and reports these results to the ABET committee. If necessary, the instructor also writes a recommendation to the ABET committee for better achieving the course outcomes the next time the course is offered.

How Data is Used to Assess Program Outcomes

Each course Learning Outcome, listed above, directly supports one or more of the Program Outcomes, as is listed in "Relationships between Learning Outcomes and Program Outcomes". For CSCI 4380, Program Outcomes (a), (b), (c), (e) and (f) are supported.

Course Master

Dr. Khaled Rasheed

Last Modified

2/4/2024 By Dr. Khaled Rasheed