
TENNESSEE TECH UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE

CSC-6220: DATA MINING

MW, 8:00-9:20AM CST, BROWN 208, 3 CREDIT HOURS, SPRING 2018

INSTRUCTOR INFORMATION

Instructor's Name: William (Bill) Eberle

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Email: weberle@tntech.edu

Office: Bruner Hall, Room 413

Office hours: Monday 1:30-3:00 and Tuesday 9:00-10:30

COURSE INFORMATION

PREREQUISITES

Graduate Standing

COURSE DESCRIPTION

This course consists of three main components: (1) Content knowledge building; (2) student research and presentations; and (3) hands-on exploration with data mining software tools. The content knowledge building portion of the course will feature instructor-led discussions on main topics in data mining. The second component involves the research relevant to an individual or team-based project and presentations to the class. The third part will involve the application of a data mining solution and presentation of the findings. The primary objective of the course is to gain an understanding of the current research problems in data mining and explore potential contributions in solving these problems.

COURSE OBJECTIVES

- ✓ Provide students with fundamental knowledge and training for analyzing and solving data mining problems in professional practice and for undertaking graduate research.
- ✓ Equip students to apply industry-standard, data mining principles across various types of data mining problems.
- ✓ Develop written and oral communication skills in graduate students that are necessary to function effectively in the profession and society.
- ✓ Provide students with a broad education that:
 - develops an appreciation and understanding of current issues in data mining and their impact on social and global issues, and
 - instills an understanding of professional and ethical responsibilities necessary for the complex modern work environment, and

STUDENT LEARNING OUTCOMES

- ✓ Ability to apply knowledge of data mining in their area of expertise.
- ✓ Ability to apply fundamental and advanced concepts of data mining.
- ✓ Ability to apply critical thinking skills to analyze and evaluate potential data mining solutions.
- ✓ Ability to convey technical data mining material through written materials and through interacting with an audience in an oral presentation.

MAJOR TEACHING METHODS

Lecture, discussion, and in-class assignments.

SPECIAL INSTRUCTIONAL PLATFORM/MATERIALS

None.

TOPICS TO BE COVERED:

1. DATA
2. DATA PREPROCESSING
3. DATA WAREHOUSING
4. MINING FREQUENT PATTERNS
5. ASSOCIATION RULES
6. CORRELATION
7. CLASSIFICATION
8. CLUSTERING
9. GRAPH MINING
10. SOCIAL NETWORK ANALYSIS
11. OUTLIER DETECTION
12. ANOMALY DETECTION

TEXTS AND REFERENCES:

Required: J. Han, M. Kamber and J. Pei, *Data Mining: Concepts and Techniques*, Third Edition.

References: Made available as needed

GRADING AND EVALUATION PROCEDURES:

HOMWORK	15%
PROJECT	55%
	Proposal and Abstract (5%)
	Introduction, Related Work, and Data (15%)
	Feature Extract, Data Prep, and Experiment Setup (15%)
	Final Paper (20%)
EXAMS	30%

GRADING SCALE

Letter Grade	Grade Range
A	90-100
B	80-89
C	70-79
D	60-69
F	59 and below

COURSE POLICIES

STUDENT ACADEMIC MISCONDUCT POLICY

Maintaining high standards of academic integrity in every class at Tennessee Tech is critical to the reputation of Tennessee Tech, its students, alumni, and the employers of Tennessee Tech graduates. The Student Academic Misconduct Policy describes the definitions of academic misconduct and policies and procedures for addressing Academic Misconduct at Tennessee Tech. For details, view the Tennessee Tech's Policy 217 – [Student Academic Misconduct at Policy Central](#).

CLASS PARTICIPATION

Students are expected to attend and actively engage with the instructor and fellow students in the class.

ASSIGNMENTS AND RELATED POLICY

The assignments are intended to provide students with the opportunity to apply what they are learning in this course. The duration of assignments will vary. **No late assignments will be accepted.**

Class Plan by Weeks or Days:

Week	Dates	Chapter	Topic	Project Deliverables
1	01/17	1	Introduction	
2	01/22-01/24	2 3	Data Data Preprocessing	
3	01/29-01/31	3 4	Data Preprocessing Data Warehousing	Proposal Title & Abstract <i>Presentation</i>
4	02/05-02/07	4	Data Warehousing Exam #1	HW #1
5	02/12-02/14	6.1-6.3	Mining Frequent Patterns Association Rules and Correlation	
6	02/19-02/21	7.1-7.4 8	More Mining Classification	Introduction, Related Work, and Data <i>Presentation</i>
7	02/26-02/28	8	Classification Exam #2	HW #2
03/05 – 03/07		SPRING BREAK		
8	03/12-03/14	9 10	Advanced Classification Clustering	Research Day Abstracts
9	03/19-03/21	10	Clustering	

		11		
10	03/26-03/28	11	Graph Mining Social Network Analysis	Feature Extraction, Data Prep, Experiment Setup <i>NO PRESENTATION</i>
11	04/02-04/04	12	Outlier Detection	
12	04/09-04/11	12	Anomaly Detection	Research Day
13	04/16-04/18	13	Data Mining Trends	HW #3
14	04/23-04/25		Exam #3 Presentations	Final Paper <i>Presentation</i>
15	05/03		Presentations	

DISABILITY ACCOMMODATION

Students with a disability requiring accommodations should contact the Office of Disability Services (ODS). An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of the course. The ODS is located in the Roaden University Center, Room 112; phone 372-6119. For details, view the Tennessee Tech's Policy 340 – [Services for Students with Disabilities at Policy Central](#).