East West University
Department of Computer Science and Engineering
Course Outline of CSE477
Summer 2019 Semester

Course Information

Course Code: **CSE477 Data Mining (Section 1)**

Credit Hours & Teaching Scheme:

	Theory	Laboratory	Total
Credit Hours	3	0	3
Contact Hours	3 Hours/Week for 13 Weeks + Final Exam in the 14th week	0	3 Hours/Week for 13 Weeks + Final Exam in the 14th week

Prerequisite: CSE365 Artificial Intelligence

Instructor Information

Instructor: Mohammad Rezwanul Huq, PhD
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Course Repository: http://bit.ly/ewucse477

Class Routine and Office Hour

Day	08:30-10:00	10:10-11:40	11:50-13:20	13:30-15:00	15:10-16:40
Sunday			**Office Hour**	**Office Hour**	CSE 110(1) Room 217
Monday	**Office Hour**	CSE 110(1) LAB Room 637		CSE 301(1) Room AB1-201	
Tuesday			**Office Hour**	CSE 477(1) Room 224	
Wednesday	**Office Hour**	CSE 301(1) LAB Room 637		CSE 301(1) Room AB1-201	
Thursday			**Office Hour**	CSE 477(1) Room 223	CSE 110(1) Room 217

Course Objectives

The objective of the course is to introduce the basic concepts of Data Mining techniques to students. The course focuses on examining the type of data to be mined and applying preprocessing methods to raw data. The course emphasizes on discovering interesting patterns, analyzing supervised and unsupervised models and estimating the accuracy of the algorithms. The students will also be introduced various Data Mining tools.

Course Outcomes (COs)

After completion of this course students will be able to:

CO1	**Apply** pattern mining algorithms for data mining tasks after processing raw input data and **analyze** the performance of these algorithms.
CO2	**Apply** and **analyze** different supervised learning algorithms for building data mining models.
CO3	**Use** appropriate unsupervised data-mining algorithms for different types of datasets and **interpret** the output appropriately.
CO4	**Choose** and **justify** appropriate algorithms and tools for data mining; **perform** and **demonstrate** skills and **write** report to design and implement Data-mining applications using realistic data sets.

Course Topics, Teaching-Learning Methods and Assessment Scheme

Course Topic	Teaching-Learning Methods	CO	Mark of Cognitive Learning Levels		CO Mark	Exam (Mark)
			C3	C4		
Introduction to Data Mining and Exploratory Data Analysis using Statistical Measures	Lecture, Class Discussion, Discussion Outside Class with Instructor/ Teaching Assistant	**CO1**	4		4	**Mid Term I Exam (20)**
Data Preprocessing: Data cleaning, Data transformation, Data reduction	Do		2	2	4	
Frequent Pattern mining using different algorithms	Do		8	4	12	
Correlation analysis, various Supervised learning algorithms and Decision Tree	Do	**CO2**	6	6	12	**Mid Term II Exam (20)**

Bayes' theorem, Naïve Bayesian classification theorem, Metrics for evaluating classification performance	Do		4	4	8	
Unsupervised learning algorithms (clustering), Basic issues in clustering, partition and hierarchical based methods	Do	**CO3**	5	10	15	**Final Exam (25)**
Density-based clustering methods and Advanced topics on Probabilistic Models, Text mining and Web mining	Do			10	10	

Programming Assignments and Presentation

Course Topic	**Teaching-Learning Method**	**CO**	**Mark of Cognitive Learning Levels**		**Mark of Psychomotor Learning Levels**		**Mark of Affective Learning Levels**	**Mark of COs**
			C3	C4	P2	P3	A2	
Assignments with reports and presentations	Group-based or Individual, moderately complex theoretical or programming assignments with report writing and oral or poster presentation	CO4	**1**	**2**	**2**	**3**	**2**	**10**

Mini Project

Mini Project	**Teaching-Learning Method**	**CO**	**Mark of Cognitive Learning Levels**		**Mark of Psychomotor Learning Levels**		**Mark of Affective Learning Levels**	**Mark of COs**
			C3	C4	P2	P3	A2	
Mini Project including Report and Presentation	Group-based moderately complex Project with report writing, and oral/poster presentation	CO4	**2**	**2**	**2**	**2**	**2**	**10**

Overall Assessment Scheme

Assessment Area	CO				Assessment Area Mark
	CO1	CO2	CO3	CO4	
Class Participation	1.54	1.54	1.92		5
Class Test/Quiz	3.08	3.08	3.84		10
Midterm Exam - I	20.00				20
Midterm Exam -II		20.00			20
Final Exam			25.00		25
Project/Assignment with report and poster/presentation*				20.00	20
Total Mark	**24.6**	**24.6**	**30.8**	**20.0**	**100**

Teaching Materials/Equipment

Text book:

[1] Jiawei Han, Micheline Kamber and Jian Pei, *Data Mining: Concepts and Techniques*, The Morgan Kaufmann Series in Data Management Systems, 3rd edition.

Reference Book:

[1] Pang-Ning Tan, Michael Steinbach, Anuj Karpatne and Vipin Kumar, *Introduction to Data Mining,* Pearson, 2nd Edition
[2] Mohammed J. Zaki, Wagner Meira Jr., *Data Mining and Analysis – Fundamental Concepts and Algorithms,* Cambridge University Press, May 2014.
[3] Ian H. Witten, Eibe Frank and Mark A. Hall, *Data Mining: Practical Machine Learning Tools and Techniques*

Project/Assignment:
Project/Assignment description will be provided in due time.

Software/Tools:

- Weka 3: Data Mining Software in Java. https://www.cs.waikato.ac.nz/ml/weka/
- Python programming language. https://www.python.org/
- Scikit-learn: Machine learning in Python. https://scikit-learn.org/stable/

Grading System

Marks (%)	Letter Grade	Grade Point	Marks (%)	Letter Grade	Grade Point
97-100	A+	4.00	73-76	C+	2.30
90-96	A	4.00	70-72	C	2.00
87-89	A-	3.70	67-69	C-	1.70
83-86	B+	3.30	63-66	D+	1.30
80-82	B	3.00	60-62	D	1.00
77-79	B-	2.70	Below 60	F	0.00

Exam Dates

Section	Mid Term I	Mid Term II	Final
1	11 June 2019	09 July 2019	20 August 2019

Academic Code of Conduct

Academic Integrity:
Any form of cheating, plagiarism, and personification, falsification of a document as well as any other form of dishonest behavior related to obtaining academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and **may lead to severe penalties as decided by the Disciplinary Committee of the university.**

Special Instructions:

- Students are expected to attend all classes and examinations. A student MUST have at least 80% class attendance to sit for the final exam.
- Students will not be allowed to enter into the classroom after 10 minutes of the starting time.
- For plagiarism, the grade will automatically become zero for that exam/assignment.
- Normally there will be **NO make-up exam**. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student misses any exam, the student MUST get approval of makeup exam by written application to the Chairperson through the Course Instructor **within 48 hours** of the exam time. Proper supporting documents in favor of the reason of missing the exam have to be presented with the application.
- For **final exam**, there will be NO makeup exam. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student misses the final exam, the student MUST get approval of **Incomplete Grade** by written application to the Chairperson through the Course Instructor **within 48 hours** of the final exam time. Proper supporting documents in favor of the reason of missing the final exam have to be presented with the application. **It is the responsibility of the student to arrange an Incomplete Exam within the deadline mentioned in the Academic Calendar in consultation with the Course Instructor**.
- All mobile phones MUST be turned to silent mode during class and exam period.
- There is **zero tolerance for cheating** in exam. Students caught with cheat sheets in their possession, whether used or not; writing on the palm of hand, back of calculators, chairs or nearby walls; copying from cheat sheets or other cheat sources; copying from other examinee, etc. would be treated as cheating in the exam hall. The only penalty for cheating is **expulsion for several semesters as decided by the Disciplinary Committee of the university**.