SENG 312-DATA MINING

Course Code	Course Name		Semester
SENG 312	Data Mining		Fall ⊠ Spring ☐ Summer ☐

Hours			Credit	ECTS
Theory	**Practice**	**Lab**	3	6
3	0	0		

Course Details	
Department	Software Engineering
Course Language	English
Course Level	Undergraduate ⊠ Graduate ☐
Mode of Delivery	Face to Face ⊠ Online ☐ Hybrid ☐
Course Type	Compulsory ⊠ Elective ☐
Course Objectives	The course objective of Data Mining is to introduce students to the concepts, techniques, and tools used to discover patterns and relationships in large datasets. Students will learn how to apply various data mining techniques, including classification, clustering, and association rule mining, to solve real-world problems. The course will also cover data warehousing, data preprocessing and feature selection methods, as well as ethical considerations in data mining. By the end of the course, students should be able to analyze data sets, apply data mining techniques to solve problems, and communicate findings effectively.
Course Content	Data warehousing fundamentals, planning, design and implementation and administration of data warehouses, data cube computation, OLAP query processing; fundamentals of data mining and relationship with data warehouse and OLAP systems; association rule mining; algorithms for clustering, classification and rule learning. Utilise various levels and types of summarisation of data to support management decision making.
Course Method/ Techniques	Lecture ⊠ Question & Answer ⊠ Presentation ⊠ Discussion ⊠
Prerequisites/ Corequisites	Database Management Systems
Work Placement(s)	

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Textbook/References/Materials

- Tan, Pang-Ning, Michael Steinbach, and Vipin Kumar. Introduction to data mining. Pearson Education India, 2016.
- Han, Jiawei, Micheline Kamber, and Jian Pei. "Data mining concepts and techniques third edition." University of Illinois at Urbana-Champaign Micheline Kamber Jian Pei Simon Fraser University (2012).
- Leskovec, Jure, Anand Rajaraman, and Jeffrey David Ullman. Mining of massive data sets. Cambridge university press, 2020.

Course Category

Mathematics and Basic Sciences	☐		Education	☐
Engineering	☒		Science	☐
Engineering Design	☐		Health	☐
Social Sciences	☐		Profession	☐

Weekly Schedule

No	Topics	Materials/Notes
1	Introduction to Data Warehousing and Business Intelligence	Lecture Slides
2	Data Warehousing	
3	Data Warehousing and OLAP	
4	Data Preprocessing	
5	Data Mining	
6	Concepts	
7	Classification and Prediction	
8	Midterm Exam	
9	Cluster Analysis	
10	Text Mining	
11	Web Mining	
12	Social Network Analysis	
13	Time Series Analysis and Forecasting	
14	Data Mining Applications	
15	Data Mining Applications	
16	Final Project	

Assessment Methods and Criteria

In-term studies	Quantity	Percentage
Attendance		
Lab		
Practice		
Fieldwork		
Course-specific internship		

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Quiz/Studio/Criticize		
Homework		
Presentation / Seminar	1	10
Project	1	50
Report	1	15
Seminar		
Midterm Exam	1	25
Final Exam		
Total		**100%**
Contribution of Midterm Studies to Success Grade		
Contribution of End of Semester Studies to Success Grade		
Total		**100%**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration (Hrs)**	**Total Workload**
Course Hours (Including Exam week)	16	3	48
Lab			
Practice			
Fieldwork			
Course-specific Work Placement			
Out-of-class study time	16	2	32
Quiz/Studio/Criticize			
Homework			
Presentation / Seminar	1	5	5
Project	1	30	30
Report	1	20	20
Midterm Exam and Preparation for Midterm	1	15	15
Final Exam and Preparation for Final Exam			
Total Workload			**150**
Total Workload / 25			**6**
ECTS Credit			**6**

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Course Learning Outcomes

No	Outcome
L1	An ability to understand the fundamental concepts and techniques of data mining
L2	Manage effective use of data stored in relational databases
L3	Create a clean, consistent repository of data within a data warehouse
L4	Utilise various levels and types of summarisation of data to support management decision making
L5	Discover patterns and knowledge that is embedded in the data using several different data mining techniques, such as neural nets, decision trees and associative rule mining

Contribution of Course Learning Outcomes to Program Competencies/Outcomes

Contribution Level: 1: Very Slight, 2: Slight, 3: Moderate, 4: Significant, 5: Very Significant

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	Total
L1	4			4						3	4	15
L2	4	4										8
L3		3			5							8
L4				4	5	4						13
L5					5							5
											Total	49

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