



## Course Specifications

<b>Course Title:</b>	<b>Data Mining</b>
<b>Course Code:</b>	<b>507PMAI-3</b>
<b>Program:</b>	<b>Professional Master of Artificial Intelligence</b>
<b>Department:</b>	<b>Computer Science</b>
<b>College:</b>	<b>Computer Science and information systems</b>
<b>Institution:</b>	<b>Najran University</b>

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## A. Course Identification

<b>1. Credit hours:</b> 3
<b>2. Course type</b>
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> 4 <sup>th</sup> level/ 2 <sup>nd</sup> year
<b>4. Pre-requisites for this course (if any):</b>
None
<b>5. Co-requisites for this course (if any):</b> NA

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	50	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

### 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	20
3	Tutorial	
4	Others (specify)	
	<b>Total</b>	50

## B. Course Objectives and Learning Outcomes

### 1. Course Description:

This course covers the theory and practice of data mining from a variety of perspectives. This course helps students master data mining techniques for both structured data which conform to a clearly defined schema, and unstructured data which exist in the form of natural language text. Specific course topics include pattern discovery, clustering, text retrieval, text mining and analytics, and data visualization. In the practical part, students will use one of the programming languages such as Python to implement the aspects of the course and create an application in field of data mining.

### 2. Course Main Objective

The main objective of this course is to provide an in-depth understanding of the principles, techniques, and applications of data mining for structured and unstructured data.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge and Understanding</b>	
1.1	describe the key concepts of data mining and its role in extracting knowledge from structured and unstructured data	K1
1.2	explain different data mining algorithms and their practical implementations	K1, K2
1.3		
1...		
<b>2</b>	<b>Skills</b>	
2.1	apply data mining techniques to a wide range of problems, including structured data and unstructured data.	S1, S4
2.2	Evaluate the applicability of different data mining techniques	S2
2.3	develop appropriate data mining solution for extract knowledge from massive data sets	S2, S4
2.4		
2.5		
<b>3</b>	<b>Competences:</b>	
3.1	Communicate clearly and effectively using the data mining technical language	C2
3.2		
3.3		
3...		

### C. Course Content

No	List of Topics	Contact Hours
1	Introduction	3
2	Data Visualization	3
3	Data Visualization for non-numerical data	3
4	Link Analysis	3
5	Search Engines and retrieval systems	3
6	Probabilistic retrieval models and statistical language models	3
7	Natural Language Processing	3
8	Topic analysis	3
9	Data Clustering	3
10	Pattern discovery	3
11	Mining Data Streams	3
12	Dimensionality Reduction	3
13	Community Detection in Graphs	3

14	Recommender Systems	3
15	Learning through Experimentation	8
<b>Total</b>		<b>50</b>

## D. Teaching and Assessment

### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and Understanding</b>		
1.1	describe the key concepts of data mining and its role in extracting knowledge from structured and unstructured data	<ul style="list-style-type: none"> <li>• Giving Lectures in PPT, recalling the lecture through asking Questions. Clarifying doubts on Lecture.</li> <li>• Discussions of real life problems, among teacher, students</li> </ul>	Quiz Theory Assignments Midterm Examination Final Examination
1.2	explain different data mining algorithms and their practical implementations		
...			
<b>2.0</b>	<b>Skills</b>		
2.1	apply data mining techniques to a wide range of problems, including structured data and unstructured data.	<ul style="list-style-type: none"> <li>• Giving Lectures in PPT, recalling the lecture through asking Questions. Clarifying doubts on Lecture.</li> <li>• Conducting a discussion of real life problems, among teacher, students</li> <li>• Cooperative learning among the students.</li> <li>• Encourage students to browse different journals, seminars or websites at their leisure time to have a better understanding about the course</li> </ul>	Quiz Lab Assignments Midterm Examination Final Examination,
2.2	Evaluate the applicability of different data mining techniques		Quiz, Theory Assignments Final Examination
2.3	develop appropriate data mining solution for extract knowledge from massive data sets		Midterm Examination Min-project Final Examination
2.4			
2.5			
<b>3.0</b>	<b>Competences</b>		
3.1	Communicate clearly and effectively using the data mining technical language.		Mini-Project presentation
3.2			
...			

### 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz1	3 <sup>rd</sup> week	5%
2	Midterm	6 <sup>th</sup> week	20%
3	Mini-Project	9 <sup>th</sup> week	15%
4	Lab Assignments	4 <sup>th</sup> , 7 <sup>th</sup> , 10 <sup>th</sup> week	15%

#	Assessment task*	Week Due	Percentage of Total Assessment Score
5	Quiz2	10 <sup>th</sup> week	5%
7	Final Exam	12 <sup>th</sup> or 13 <sup>th</sup> week	40%
8			

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

**Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :**

- Weekly office hours
- Pre-booked Appointments
- Additional office hours prior exams
- Weekly academic advising hours

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	<ul style="list-style-type: none"> <li>• Introduction to Data Mining, Pang-Ning, Michael Steinbatch et al, 2020</li> </ul>
<b>Essential References Materials</b>	<ul style="list-style-type: none"> <li>• Mining Massive Datasets, Jure Leskovec, Anand Rajaraman, Jeff Ullman, Third Edition.</li> </ul>
<b>Electronic Materials</b>	
<b>Other Learning Materials</b>	

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	Room B-59 Laboratory B-113L
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	Data show, PCs.
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> <li>• Printer is important in the lab to print reports and some snapshots.</li> <li>• Projector and PC for the lab instructor is required</li> </ul>

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Online course survey	Students	Indirect
course learning outcomes achievement survey	Students	Indirect
achievement of course learning outcomes	instructor	Direct

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

Council / Committee	Computer Science Departmental Council
Reference No.	14440203-0185-00002
Date	1st Sep, 2022