Course Specification
(Postgraduate)

Course Title: Data Mining

Course Code: 501832-3

Program: Master in Artificial Intelligence

Department: Computer Science

College: Computers and Information Technology

Institution: Taif University

Version: V2

Last Revision Date: 5 May 2024

قسم علوم الحاسب
Computer Science Department

TU
جامعة الطائف
TAIF UNIVERSITY

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A. General information about the course:

1. Course Identification:

1. Credit hours: (3)

2. Course type

A.	☐University	☐College	☒ Department	☐Track
B.	☐ Required		☒ Elective	

3. Level/year at which this course is offered: (Year: 1, Level: 1)

4. Course general Description:

This course introduces the basic concepts, implementation techniques, and applications of data mining, with a focus on two major data mining processes: pattern discovery and cluster analysis. The pattern discovery process includes data selection, pre-processing, feature selection, using different statistical and machine learning techniques, and visualization of the generated structures. Classification, association, and clustering analysis are going to be covered. Text and web mining techniques are going to be introduced. Case studies from different real word application areas such health and marketing are going to be introduced, and students will be encouraged to consolidate their learning by designing simple data mining projects and present their results.

5. Pre-requirements for this course (if any)**:**

None.

6. Co-requirements for this course (if any)**:**

None.

7. Course Main Objective(s):

The objectives of this course are as follows:
- To introduce students to the basic concepts and techniques of Data Mining.
- To develop skills of using recent data mining software for solving practical problems to gain experience of doing real world applications.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	36	80%
2	E-learning	9	20%
3	Hybrid ▪ Traditional classroom ▪ E-learning	0	0%
4	Distance learning	0	0%

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	**45**
2.	**Laboratory/Studio**	-
3.	**Field**	-
4.	**Tutorial**	-
5.	**Others (specify): Mid-Term and Final Exams**	-
	Total	**45**

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Explain methods of pre-processing, classifications, association, and clustering.	**K1**	Lecture, Brainstorming, Discussion	**Direct:** Quiz, Exam **Indirect:** Survey
2.0	**Skills**			
2.1	Analyze methods of pre-processing, classifications, association, and clustering.	**S1**	Lecture, Problem Solving, Self-learning	**Direct:** Quiz, Exam **Indirect:** Survey
2.2	Apply data mining in health and marketing.	**S2**	Lecture, Project, Problem Solving, Self-learning	**Direct:** Project **Indirect:** Survey
2.3	Communicate methods of pre-processing, classifications, association, and clustering.	**S3**	Lecture, Project, Problem Solving, Self-learning	**Direct:** Quiz, Exam, Project **Indirect:** Survey
3.0	**Values, autonomy, and responsibility**			
3.1	Function effectively as a member or leader of a team engaged in activities appropriate to the field of data mining.	**V2**	Discussion, Project	**Direct:** Project, Presentation **Indirect:** Survey

C. Course Content:

No	List of Topics	Contact Hours
1.	An overview of Data Mining	3
2.	Data pre-processing & exploration	3
3.	Feature selection	3
4.	Linear Regression	3
5.	Classification methods & model evaluation	6
6.	Association methods	6
7.	Clustering method	6
8.	Text and web mining methods	6
9.	Practical applications of data mining in health and marketing	6
10.	Students' practical projects presentations	3
Total		**45**

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz-1: Data Pre-processing & Regression	W4	**10%**
2.	Quiz-2: Classification & Model Evaluation	W6	**10%**
3.	Initial Group Project Presentations (proposal)	W7	**10%**
4.	Quiz-3: Association Rule	W8	**10%**
5.	Quiz-4: Clustering	W10	**10%**
6.	Final Group Project Presentations	W13	**20%**
7.	Final Exam	W15	**30%**

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	▪ Ian Witten, Eibe Frank, and Mark Hall, Data Mining: Practical Machine Learning Tools and Techniques, Elsevier Inc. Publication, 2012.
Supportive References	▪ Max Bramer, Principles of Data Mining, Springer-Verlag Publication, 2013. ▪ Other references will be suggested in the classroom
Electronic Materials	▪ The world's most trusted open ecosystem for sourcing, building, and deploying data science and AI initiatives: https://www.anaconda.com/ ▪ https://www.w3schools.com/python/

Other Learning Materials	▪ Links provided by instructor. ▪ Handouts and Presentations prepared by instructor. ▪ Blackboard.

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	▪ Classroom (20 students/class) ▪ Computer labs
Technology equipment (Projector, smart board, software)	▪ Video projector / data show ▪ White board
Other equipment (Depending on the nature of the specialty)	▪ To be announced during the course!

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students Coordinator	Indirect (Course exit survey) Indirect (Feedback from Course Coordinator)
Effectiveness of students assessment	Faculty member Coordinator	Indirect (Feedback from Faculty member) Indirect (Feedback from Course Coordinator)
Quality of learning resources	Students Faculty member Coordinator Council Curriculum Committees	Indirect (Course exit survey) Indirect (Feedback from Faculty member) Indirect (Feedback from Course Coordinator) Indirect (Feedback from council) Indirect (Feedback from Graduate Committees)
The extent to which CLOs have been achieved	Students Faculty member Coordinator Curriculum Committees	Indirect (Course exit survey) Indirect (Feedback from Faculty member/ Course Coordinator/ Graduate Committee)
Other	-	-

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	GRADUATE PROGRAMS COMMITTEE – CS DEPT.
REFERENCE NO.	V2
DATE	5/5/2024

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