

جامعة الزيتونية الأردنية

Al-Zaytoonah University of Jordan کلية العلوم وتکنولوجيا المعلومات Faculty of Science and Information Technology



" عراقة وجودة" "Tradition and Quality"

QF01/0408-4.0E

Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Artificial Intelligence Department

Study plan No.	2020/2021	University Specialization	Artificial Intelligence
Course No.	0142334	Course name	Data Mining
Credit	3	Prerequisite Co-requisite Introduct	
Hours		•	Science
Course type	□ MANDATORY UNIVERSITY ELECTIVE REQUIREMENT REQUIREMENTS	□ FACULTY □ Support course MANDATORY family REQUIREMENT requirements	☐ Mandatory
Teaching style	☐ Full online learning	☐ Blended learning	Traditional learning
Teaching model	☐ 2Synchronous: 1asynchronous	☐ 2 face to face : 1synchronous	3 Traditional

Faculty member and study divisions information (to be filled in each semester by the subject instructor)

Name	Academic rank	Office No.	Phone No.	E-1	nail
Bilal Hawashin	Associate professor			b.hawashin@zuj.edu.j	
Division number	Time	Place	Number of students	Teaching style	Approved model
1					

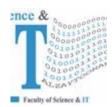
Brief description

This course provides the following topics:

Introduction to Data Mining, Classification, Clustering, Association Rule Discovery, Anomaly Detection, Web Mining, Collaborative Filtering, and various data mining topics.

Learning resources

Edulining Tesources				
Course book information	Ian Goodfellow, Yoshua Bengio, and Aaron Courville, Deep Learning,			
(Title, author, date of issue,	2016.			
publisher etc)				
Supportive learning resources	1- Charu Aggarwal. Data Mining, the text book. Springer. 2015			
(Books, databases, periodicals,				
software, applications, others)	2- Ian Witten, Eibe Frank, Mark Hall, and Christopher Pal. Data			
	Mining: Practical Machine Learning Tools and Techniques. Morgan			
	Kaufmann. 2016.		-	
Supporting websites				
The physical environment for	Class room	□ labs	☐ Virtual	☐ Others
teaching			educational	
			platform	



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Necessary equipment and software	
Supporting people with special	
needs	
For technical support	

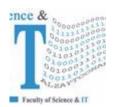
Course learning outcomes (S= Skills, C= Competences K= Knowledge,)

No.	Course learning outcomes	The associated program learning output code			
	Knowledge				
K1	To have a good comprehension of the Classification, Clustering, and association rule discovery.	MK3			
K2	To have a good understanding of various advanced data mining topics.	MK3			
	Skills				
S1	To be able to categorize each scenario to DM or Non DM task.	MS3			
S2	To be able to use WEKA to solve data mining problems.	MS3			
S3	To be able to compute cosine similarity, Euclidian distance between	MS3			
	vectors				
S4	To be able to select features based on TF.IDF method	MS3			
S5	To be able to compute manually the results of certain data mining algorithms such as decision tree, ANN, KNN, K-Means, and Apriori.	MS3			
	Competences				
C 1	To be able to use data mining methods to solve real-life problems.	MC1			

Mechanisms for direct evaluation of learning outcomes

Type of assessment / learning style	Fully electronic learning	Blended learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
First exam	0	0	%20	0
Second / midterm exam	%30	%30	%20	30%
Participation / practical applications	0	0	10	30%
Asynchronous interactive activities	%30	%30	0	0
final exam	%40	%40	%50	40%

Note: Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.



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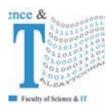
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Schedule of simultaneous / face-to-face encounters and their topics

Week	Subject	learning style*	Reference **
1	Data Mining Definition. Data	Lectures	1-16
	Mining Categories.		(Ref1)
2	Data Preprocessing. Types of Data.	Lectures	22.44
	Enhancing Data Quality. Similarity		22-44 (Deff)
	Measurements.		(Ref1)
3	Sampling and Feature Selection.	Lectures	
	Types of Sampling. Feature		47-55
	Selection Methods. Mean TF.IDF.		(Ref1)
	CHI Square.		
4	Classification Introduction.	Lectures	
	Decision Support Trees, K-Nearest		145-276
	Neighborhood, Support Vector		(Ref1)
	Machines, Artificial Neural		(RCII)
	Networks.		
5	Classification Rule Based	Lectures	145-276
	Classification. Using WEKA to		(Ref1)
	apply classification.	-	(11011)
6	Clustering Introduction. KMeans	Lectures	487-526
	Algorithm. Hierarchical Clustering.		(Ref1)
_	Using WEKA to apply clustering.	1	(====)
7	Case Study	Learning Through Problem	
0		Solving	
9	Mid Exam	T	
9	Association Rules. Apriori	Lectures	
	Algorithm.		327-353
	Dimensionality Reduction Methods. Introduction. Latent		
	Semantic Indexing. Information		(Ref1)
	Retreival.		
10	Various Data Mining Topics.	Lectures	
10	Collaborative Filtering. Web	Lectures	Ref2
	Mining. Data ware Housing.		13012
11	Various Data Mining Topics.	Lectures	
	Graph Mining. Social Network		Ref2
	Analysis. Data Stream Mining.		11012
12		Lectures	12-27
	Introduction to Deep Learning.		(TB)
13	Advanced Deep Learning and	Lectures	, ,
	Data Mining Topics.		(TB)
14	Project Presentations.	Participatory Learning	
15	Project Presentations.	Participatory Learning	
16	Final Exam		



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Schedule of asynchronous interactive activities (in the case of e-learning and blended learning)

Week	Task / activity	Reference	Expected results
1	Data Mining Types		To be able to categorize
			real life scenarios
			according to their type
			(classification,
			clustering, anomaly
			detection, association
			rule mining, not data
			mining)
2	Types of Data Recognition		To be able to recognize
			data type in given
			scenarios
3	Feature Selection Using Mean TF.IDF		To be able to find Mean
			TF.IDF for one or more
			features and select
			among them
4	Data Preprocessing		To be able to perform
			some data
			preprocessing tasks
5	Data Scaling and Normalization		To apply data scaling
			and normalization on
			the data
6	Data Transformation		To apply certain data
			transformations on the
			data
7	Finding Similarity and Distance		To find the cosine
	Between Items		similarity and Euclidean
			distance between two
			vectors
8	Applying KNN Classifier		To use KNN to classify
			testing records
9	Evaluating KNN		To compute some
			evaluation
			measurements for the
			classifier
10	Applying Decision Tree		To build manually a
			decision tree given a
			training data and use it
44			in the classification
11	Applying ANN		To classify testing data

^{*} Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.

^{**} Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.



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		using a given ANN classifier
12	Applying Clustering using K-Means	To do the first two iterations in K-Means clustering given a dataset
13	Applying Apriori	To apply Apriori to find frequent itemsets
14	Applying WEKA	To use weka to solve a real life problem
15	Applying Recommender Systems	To use item-item and user-user similarities to give recommendations
16		