جامعة الزيتونــة الأردنيــة
Al-Zaytoonah University of Jordan
كلية العلوم وتكنولوجيا المعلومات
Faculty of Science and IT

" 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.	**0142442**	**Course name**	Artificial Neural Networks
Credit Hours	**3**	**Prerequisite Co-requisite**	Machine Learning

Course type	☐ MANDATORY UNIVERSITY REQUIREMENT	☐ UNIVERSITY ELECTIVE REQUIREMENTS	☐ FACULTY MANDATORY REQUIREMENT	☐ Support course family requirements	☐ Mandatory requirements	✓Elective requirements
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-mail**	

Division number	**Time**	**Place**	**Number of students**	**Teaching style**	**Approved model**

Brief description

This course provides the following topics: Introduction to Classification, Logistic Regression, Artificial Neural Networks, Gradient Descent, Applications of ANN, Vectorization, Deep Learning, Types of Deep Learning, Applications of Deep learning.

Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	1- Logistic Regression Models (Chapman & Hall/CRC Texts in Statistical Science) 1st Edition, 2017. 2- Neural Networks and Deep Learning: A Textbook Charu C. Aggarwal, Springer, 2018.
Supportive learning resources (Books, databases, periodicals, software, applications, others)	**1-** Charu Aggarwal. Data Mining, the text book. Springer. **2015** 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 teaching	Class room	☐	labs	☐	Virtual educational platform	☐	Others
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 understand how logistic regression works	**MK3**
K2	To have the knowledge of how ANN works	MK3
K3	To understand the different concepts related to ANN such as vectorization and parameter tuning	MK3
Skills		
S1	To be able to apply logistic regression models on typical problems using python	**MS3**
S2	To be able to apply ANN models on typical problems using python	**MS3**
S3	To be able to compute the output of logistic regression manually	**MS3**
Competences		
C1	To be able to use logistic regression in solving a real life problem	**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%

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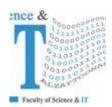| QF01/0408-4.0E	Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Artificial Intelligence Department

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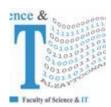
Schedule of simultaneous / face-to-face encounters and their topics

Week	Subject	learning style*	Reference **
1	**Introduction into Classification.**	Lectures	**Ref 1. 285-300**
2	**Applications of Classifications Introduction into Logistic Regression**	Lectures	**Ref1. 300-344 + Text1 63-71**
3	**Logistic Regression Examples in Python Gradient Descent** of Logistic Regression HW1 Out	Lectures	**Python Examples given in class + Text1 63-71**
4	**Introduction into Vectorization** Vectorization in Logistic Regression	Lectures	**Python Examples given in class**
5	**Derivative Meaning Introduction into ANN**	Lectures	**Text2 1-52**
6	Mid Exam Estimated + Revision	learning through problem solving	
7	**ANN Examples in Python HW2 Out**	Lectures	**Python Examples given in class**
8	**Vectorization of ANN Gradient Descent of ANN Loss Functions**	Lectures	**Text2 105-167**
9	**Deep ANN Deep ANN Examples in Python** HW3 Out	Lectures	**Text2 170-200 + Examples given in class**
10	**Learning Curve CNN RNN**	Lectures	**Text2 200-216**
11	**Case Study 1: ANN for estimating functions**	learning through problem solving	**Given in class**
12	**Case Study 2: ANN for**	learning through problem solving	**Given in class**
13	**Presentations**	participatory learning	
14	**Presentations.**	participatory learning	
15	**Presentations.**	participatory learning	
16	**Final Exam**		

* 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.

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

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Week	Task / activity	Reference	Expected results
1	Data Mining Categorization		To categorize various scenarios into their data mining types
2	Logistic Regression Part1		To compute manually the output of a regression model
3	Logistic Regression Part2		To compute manually the output of a regression model
4	One Hot Encoding		To apply one hot encoding on data
5	Logistic Regression Using Loop		To use logistic regression using python
6	Logistic Regression Using Vectorization		To apply vectorization on logistic regression using python
7	Exam		
8	Logistic Regression Using Vectorization		To apply vectorization on logistic regression using python
9	Learning Rate		To use learning rate on logistic regression
10	Biase		To use biase
11	ANN Part1		To apply ANN using python
12	ANN Part2		To apply ANN using python
13	Deep Learning		To apply Deep Learning using python
14	Presentations		To present a trending topic in ANN
15	Presentations		To present a trending topic in ANN
16	Exam		