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

Study plan No.	**2021/2022**		**University Specialization**		Artificial Intelligence		
Course No.	**0142450**		**Course name**		Advanced Data Analytics		
Credit Hours	**3**		**Prerequisite Co-requisite**		Introduction into Data Science		
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**
1					

Brief description

This course includes the following topics: Data summarization, Data visualization, Model Selection, Linear Regression, forecasting using Gretl, Time series forecasting using RNN, Social Network analysis, recommender systems, association rule discovery, outlier detection.

Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	**1-** Data Analytics Made Accessible. Anil Mahishwari, 2020.			
Supportive learning resources (Books, databases, periodicals, software, applications, others)	1-Data Mining, Concepts and Techniques, Jiawei Han, 3rd edition, 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 show excellent knowledge in the basics of data analytics	**MK3**
K2	To be acquainted with the basics of various advanced data analytics topics topics.	MK3
K3		
	Skills	
S1	To be able to apply data analytics concepts to perform various tasks such as visualization, summarization, and forecasting.	**MS3**
S2		
S3		
	Competences	
C1	To apply the various concepts of data analytics in solving 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.

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

Week	Subject	learning style*	Reference **
1	Data Summarization	Lecture	**Handout**
2	Data Visualization	Lecture	**T: 93**

3	Linear Regression	Lecture	**T: 135**
4	Forecasting LR Using Gretl	Lecture	**Handout**
5	Time Series Forecasting using RNN	Lecture	**Handout**
6	**Case Study1**	learning through problem solving	**Handout**
7	Mid Exam	learning through problem solving	**-**
8	Social Network Analysis	Lecture	**Handout**
9	Web Analysis	Lecture	**T: 224**
10	Recommender Systems	Lecture	**Handout**
11	Association Rule Discovery	Lecture	**T: 190**
12	Association Rule Discovery	Lecture	**T: 210**
13	Outlier Detection	Lecture	**R: 543**
14	**Case Study 2**	learning through problem solving	**Handout**
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)

Week	Task / activity	Reference	Expected results
1	Data Summarization		To apply data summarization methods on a given dataset
2	Data Visualization		To apply data visualization methods on a given dataset
3	Linear Regression		To apply forecasting using linear regression on python
4	Forecasting LR Using Gretl		To apply forecasting using linear regression on Gretl
5	Time Series Forecasting using RNN		To apply forecasting using RNN on Python
6	**Case Study1**		To use data analytics concepts on a real life scenario
7	Mid Exam		
8	Social Network Analysis		To apply social network analysis methods
9	Web Analysis		To apply web analysis methods on a given dataset
10	Recommender Systems		To apply recommender

			systems concepts on a given dataset
11	Association Rule Discovery		To find frequent itemsets using Apriori on a given dataset
12	Association Rule Discovery		To generate rules using Apriori on a given dataset
13	Outlier Detection		To apply outlier detection methods
14	**Case Study 2**		To apply various data analytics concepts in a real life scenario
15	**Presentations.**		To present an advanced topic in data analytics
16	**Final Exam**		