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

Study plan No.	2022-2023		**University Specialization**		Artificial Intelligence		
Course No.	0142230		**Course name**		Introduction to Data Science		
Credit Hours	3		**Prerequisite Co-requisite**		Probabilities and Statistics		
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	☐ **2 Synchronous: 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 includes the following topics:
Introduction to data science, data preprocessing, data cleaning, data transformation, data visualization, and statistics in data science.

Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	1- INTRODUCTION TO DATA SCIENCE Essential Concepts, Peters Morgan, AI Science, 2017			
Supportive learning resources (Books, databases, periodicals, software, applications, others)	1-An Introduction to Data Science**,** By Jeffrey S. Saltz, Jeffrey M. Stanton, SAGE, 2018 2-Introducing Data Science, big data, machine learning, and more, using python tools. Davy Cielen, Arno D. B. Meysman, and Mohamed Ali, Manning, 2016.			
Supporting websites	-			
The physical environment for teaching	Class room	☐ labs	☐ Virtual educational platform	☐ Others
Necessary equipment and software	**R Studio**			

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 basic data science topics	**MK3**
K2	To be acquainted with the basics of various advanced data science topics.	MK3
	Skills	
S1	To be able to apply data science concepts to perform various tasks such as preprocessing, visualization, and transformation.	**MS3**
	Competences	
C1	To apply the various concepts of data science 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	Definitions and notions of data science. How data science is related to other disciplines. Computation thinking – a way to solve problems systematically.	Lecture	**TB1:Ch1**

2	What skills data scientists needs Data presentation and storage.	Lecture	**TB1:Ch1**
3	Data Types. Data collection.	Lecture	**TB1:Ch1**
4	Data pre-processing.	Lecture	**TB1:Ch2**
5	Data pre-processing.	Lecture	**TB1:Ch2**
6	Knowing the various forms of data analysis and analytics techniques.	Lecture	**TB1:Ch3**
7	Introduction to correlation and regression.	Lecture	**TB1:Ch4**
8	Introduction to correlation and regression. **Midterm**	Lecture	**TB1:Ch4**
9	How to undertake simple summaries and presentations of numerical and categorical data	Lecture	**TB1:Ch4**
10	How to undertake simple summaries and presentations of numerical and categorical data	Lecture	**TB1:Ch4**
11	Knowing the basic statements in R	Lecture + problem solving	**RF1:Ch3**
12	Control structures in R.	Lecture + problem solving	**RF1:Ch3**
13	Vectors, Data frames	Lecture + problem solving	**RF1: Ch5**
14	Handling missing data, and summarizing data in R	Lecture + problem solving	**RF1:Ch6**
15	Handling missing data, and summarizing data in R	Lecture + problem solving	**RF1:Ch6**
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.**