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.	**0142210**		**Course name**		**Computing systems for data science and artificial intelligence**		
Credit Hours	**3 hours**		**Prerequisite Co-requisite**		**Introduction to 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	☐ **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	
To be filled by the instructor					
Division number	**Time**	**Place**	**Number of students**	**Teaching style**	**Approved model**
To be filled by the instructor					

Brief description

This course is intended to provide an overview of different software and tools that assist data scientists in the data analysis process. These tools includes Spark, Hadoop, R, etc. Additionally, it gives an introduction to cloud computing, big data computing, and IoT computing.

Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	1- R for Data Science. Hadley Wickham and Garrett Grolemund, O'Reilly -2017. 2- Introduction to Computation and Programming Using Python, By John V. Guttag and Julie Sussman, 2016. 3- Introduction to Cloud Computing, M Praveen, 2020.			
Supportive learning resources (Books, databases, periodicals, software, applications, others)	1. Data Analytics with Hadoop, Benjamin Bengfort and Jenny Kim, O'Reilly Media, 2016 2. Data Science Thinking The Next Scientific, Technological and Economic Revolution, Longbing Cao, Springer, 2018.			
Supporting websites				
The physical environment for teaching	☑ Class room	☐ labs	☐ Virtual educational platform	☐ Others
Supporting people with special needs	----------			
For technical support	----------			

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

No.	Course learning outcomes	The associated program learning output code
	Knowledge	
K1	**Understand different types of computing for data science using different tools.**	**MK3**
K2	**Learn about different data science tools.**	**MK3**
	Skills	
S1	**Applying Hadoop and Spark for big data computing.**	**MS3**
S2	**Applying R in statistical computing.**	**MS3**
S3	**Applying Weka for data science.**	**MS3**
	Competences	
C1	**The ability to apply various cutting-edge tools for data science.**	**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, and 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 to Data Science	Lectures	Handouts
2	Weka Toolkit for Data Science	Lectures	Handouts
3	Weka Toolkit for Data Science	Lectures	Handouts
4	Case Study 1: Using Weka on a given dataset	Lectures	Handouts
5	Statistical Computing Systems – Introduction into R	Lectures	TB1
6	Statistical Computing using R	Lectures	TB1
7	Mid Exam Estimated + Revision	Lectures	TB2
8	Computing Platforms: IDEs, Notebooks, Google Colab, Jupyter	Lectures	TB2
9	Computation in Python	Lectures	TB2
10	Case Study 2: Computation in Python	Lectures	TB2
11	Introduction to Big Data Computing – Hadoop and Spark	Lectures	Handouts
12	Introduction into Cloud Computing	Lectures	TB3
13	AWS, Azure, and Google Cloud for Data Science	Lectures	Handouts
14	Introduction to Deep Learning Computing using GPUs, CUDA, Keras, and Tensorflow	Lectures	Handouts
15	Introduction to IOT Computing using Arduino Systems	Lectures	Handouts
16	**Final Exam**		

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*** 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.**