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

Study plan No.	**2022/2032**		**University Specialization**		**Artificial Intelligence**	
Course No.	**0142225**		**Course name**		**Data Science and Artificial Intelligence programming 2**	
Credit Hours	**3 hours**		**Prerequisite Co-requisite**		**Data Science and Artificial Intelligence programming 1**	
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 is an advanced course in Python language for AI students. This course covers topics related to OOP in Python. Additionally, it introduces basic machine learning libraries such as NumPy, pandas, matplotlib, and Scikit-learn.

Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	Gayathri Rajagopalan, "A Python Data Analyst's Toolkit Learn Python and Python-based Libraries with Applications in Data Analysis and Statistics", APRESS, 2022.			
Supportive learning resources (Books, databases, periodicals, software, applications, others)	1. Dan Bader, Joanna Jablonski and Fletcher Heisler, "Python Basics: A Practical Introduction to Python 3", 4th ed, Ron Holland Designs, 2021. 2. John V. Guttag , "Introduction to Computation and Programming Using Python with Application to Understanding Data", MIT press,2017 3. Python Data Analytics, ISBN-13 (electronic): 978-1-4842-3913-1 January 2018			
Supporting websites	https://docs.python.org/			
The physical environment for teaching	☑ Class room	☐ labs	☐ Virtual educational platform	☐ Others
Necessary equipment and software	PyCharm : https://www.jetbrains.com/pycharm/ Or Anaconda: https://www.anaconda.com/			
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 the advanced topics in object-oriented programming in Python, including defining classes, invoking methods, using class libraries, etc.**	**MK2**
K2	**Have the ability to use the rich libraries in python that are related to artificial intelligence to write programs for machine learning**	**MK2**
	Skills	
S1	**Knowledge of the structure and model of the Python programming language.**	**MS2**
S2	**Write python programs using NumPy, matplotlib and pandas.**	**MS2**
	Competences	
C1	**The ability to implement programs using OOP concepts**	**MC1**
C2	**The ability to write programs using common libraries used for AI**	**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

Weeks	Subject	learning style*	Reference **
1 -3	Exploring Classes, and Objects	Lectures	TB1: 45-71
4	File processing	Lectures	Lecture Notes
5-7	Working with NumPy Arrays	Lectures	TB1: 117-141
8	Applications Midterm Exam	Lectures	-
9-11	Prepping Your Data with Pandas	Lectures	TB1: 147-179
12-14	Data Visualization with Python Libraries	Lectures	TB1: 243-256
15	Scikit-learn		Lecture Notes
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.**