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.	0142351		**Course name**		**Robotics**	
Credit Hours	**3 hours**		**Prerequisite Co-requisite**			
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

The goal of this course is to provide basic knowledge of Robotic systems the applications related to them. The course will cover the following topics: types and classifications of robots, degrees of freedom, robot dynamics and kinematics, robot sensors and vision applications, robotic actuator systems, basic control systems for robots, embedded systems and artificial intelligence in robotic systems.Arduino kits, servo motors and different sensors are used to design 3 DoF manipulators and rovers

Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	1- Modern Robotics, Mechanics, Planning, and Control, Kevin M. Lynch, 2019 2- Introduction to Robotics, Niku Saeed, Willy,2017			
Supportive learning resources (Books, databases, periodicals, software, applications, others)	1. Fundamentals of Robotics by D.K. Pratihar Narosa Publishing House Pvt. Ltd., New Delhi, 2017.			
Supporting websites				
The physical environment for teaching	☑ Class room	☐ labs	☐ Virtual educational platform	☐ Others
Necessary equipment and software	Zoom, Python, ARDUINO			
Supporting people with special needs	----------			
For technical support	----------			

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

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No.	Course learning outcomes	The associated program learning output code
	Knowledge	
K1	Understand different types of robots.	MK3
K2	Learn about Kinematics and inverse kinematics .	MK3
	Skills	
S1	Applying Python or Arduino to program the robot component.	MS3
S2	Applying position movement and rotational matrix using python or arduino.	MS3
	Competences	
C1	Design of a robot that perform simple tasks	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	Fundamental	Lectures	Handouts + Text books
2	Fundamental	Lectures	Handouts + Text books
3	Kinematics of Robots	Lectures	Handouts + Text books
4	Kinematics of Robots	Lectures	Handouts + Text books
5	Kinematics of Robots	Lectures	Handout and lab notes
6	Kinematics of Robots	Lectures	Handout and lab notes
7	Differential Motion	Lectures	Handouts + Text books
8	Differential Motion	Lectures	Handouts + Text books
9	Sensors	Lectures	Handouts + Text books
10	Actuators	Lectures	Handouts + Text books
11	Motors and Drivers	Lectures	Handouts + Text books
12	Motion Control	Lectures	Handouts + Text books
13	Robot Vision	Lectures	Handouts + Text books
14	Robot Vision	Lectures	Handouts + Text books
15	Artificial intelligence in Robots	Lectures	Handouts + Text books
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.**