FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Robot Control

Information :

Course Code :	MKT 472	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Specialization of Mechatronics Engineering

Instructor Information :

Title	Name	Office hours
Professor	Osama Esmail Mahmoud Esmail	1
Lecturer	MOHAMED ABDELBAR SHAMSELDIN ALY	9
Teaching Assistant	Donia Waheed Mohamed Abdelmonem Saleem	

Area Of Study :

This courseaims to:
Introduce different methods for path planning for robot manipulators.
Explain different methods for controlling robot manipulators, including Fuzzy Logic Control.
Enrich the studentôs knowledge about control of manipulators.
Train students to design, simulate, build, and test a robot manipulator.

Description :

Path and trajectory planning; Manipulator dynamics; Independent joint control; Force control; Geometric nonlinear control; Computer vision; Visual servo control; Fuzzy control; Robot control system design; Problem solving using up-to-date standard S/W robotics tools (MATLABÈ).

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Define different terms used in classic and Fuzzy Logic Control.
2 -	List different methods for path planning of manipulators.
3 -	Explain Different methods for control robot manipulators.
4 -	Describe manipulator dynamics and computer vision.
b.Intellectual Skills: :	
1 -	Analyse manipulators' dynamics.
2 -	Calculate parameters for a smooth trajectory, and optimum parameters for classic and fuzzy controllers of manipulators.
3 -	Select suitable parameters for robot controllers.
4 -	Analyse the results of different controllers for manipulators.
c.Professional and Practical Skills: :	
1 -	Analyse lab experimental results of control manipulators with different control methods.

2 -	Use the suitable hardware components and software for drafting and implementing a simple manipulator.
3 -	Apply knowledge of mathematics, science, information technology, design and engineering practice integrally to identify, formulate and solve engineering and field problems related to Robot manipulators.
4 -	Prepare and present technical reports.
d.General and Transferable Skills: :	
1 -	Search for information and engage in life-long self-learning.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Path and trajectory planning	10	4	6
Manipulator dynamics; Independent joint control	8	4	4
Force control	8	4	4
Geometric nonlinear control	8	4	4
Computer vision; Visual servo control	10	6	4
Fuzzy control	8	4	4
Robot control system design	8	4	4

Teaching And Learning Methodologies :

- Interactive Lecturing
- Problem solving
- Experiential learning
- Discussion
- Project
- Research

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments, Participation, & Quizzes	20.00		
Final Exam	40.00	16	
First Midterm Exam	15.00	6	
Project.	10.00		
Second Midterm Exam	15.00	11	

Recommended books :

S. B. Niku, "Intruduction to Robotics, analysis, control, applications".
John Wily and Son, 2nd edition