FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Mechatronics System Design

Information :

Course Code :	MKT 412	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Specialization of Mechatronics Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	MOHAMED ABDELBAR SHAMSELDIN ALY	3
Teaching Assistant	Osama Ahmed Ibrahim Mohamed Montaser	
Teaching Assistant	Fady Ayman Mohamed Naguib Mahmoud Noah	2

Area Of Study :

Introduce mechatronic system design methodology and evaluation.
Comparison for mechatronics design elements including computing, sensors and actuators.
Train students to design and evaluate complete Mechatronics systems.

Description :

Introduction to Mechatronics system design; VDI design guideline for mechatronics system design; Basic control logic; Controller design for mechatronics systems using logic controllers, microcontrollers, PC-based controller, and PLCs; Embedded microprocessor system and control; Design of sensors and power transmission systems;
Two projects to design a prototype mechatronic device.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Define Mechatronics design procedure.
2 -	List the different types of computing devices, actuation systems and sensing elements.
3 -	Explain the design rules of man-machine interface design.
b.Intellectual Skills: :	
1 -	Calculate suitable motor size for mechatronics system.
2 -	Select the proper computing device, sensors and actuators for a mechatronics system among several alternatives.
3 -	Design a user interface for a mechatronic system to satisfy user requirements.
c.Professional and Practical Skills: :	
1 -	Analyse lab experimental results for running project and program arduino or other microcontroller.
2 -	Prepare and present a technical report for course project.
d.General and Transferable Skills: :	
1 -	Work in stressful environment and within constraints through assignments and course project

2 -	Communicate effectively through presentation and discussion of the course project.
3 -	Effectively manage tasks, time, and resources.
4 -	Search for information and engage in life-long self-learning discipline through self-learning assignments

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction: Mechatronics system design procedure	4	2	2
Critical thinking and system evaluation	6	4	2
Computing devices, types of computing devices, comparison	14	8	6
Actuation types, how to select type, and size the actuator	18	10	8
Sensor types and rules for comparison and selection.	6	4	2
Design rules of user interface for systems	4	0	4
Project proposal	6	2	4
Project follow -up	2	0	2

Teaching And Learning Methodologies :

Interactive Lecturing
Problem solving
Experiential learning
Discussion
Assignment
Project
Research

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments, Participation, & Quizzes	25.00		
Final Exam	40.00	16	
Midterm	15.00	5	
Project.	20.00		

Recommended books :

Bolton, William ñMechatronics: Electronic Control Systems in Mechanical and Electrical Engineeringò, Prentice Hall, 2003.
Alciatore, David G.& Histand, Michael B.; ñIntroduction to Mechatronics and Measurement Systemò, McGraw Hill.