FUTURE UNIVERSITY IN EGYPT
جامعة المستقبل

Faculty of Engineering & Technology

Sensors and Signal Conditioning

Information :

Course Code :	MKT 505	**Level :**	Undergraduate	**Course Hours :**	2.00- Hours

Department : Specialization of Mechatronics Engineering

Instructor Information :

Title	Name	Office hours
Associate Professor	Mohamed Ali Mohamed Elsayed Torad	3
Teaching Assistant	Saleh Abdelrahman Ali Mostafa	

Area Of Study :

Introduce sensors and transducers as main elements in Mechatronics systems.
Enrich the studentôs basic knowledge about signal conditioning units to prepare signals to be suitable for next stage.
Train students to calibrate, select, and use sensors in Mechatronics, systems.

Description :

Analog Signal Conditioning, Digital Signal Conditioning, Temperature Sensors. Mechanical Sensors, Optical Sensors, Ultrasonic Sensors, Fiber Optic Sensors.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	a1. Define sensors and transducers.
2 -	a2. Explain the principals of different sensors including: position,
3 -	a3. Explain the principals of analog signal conditioning using
4 -	a4. Describe the function of the different types of A/D & D/A
5 -	a5. Discus the modern trends in sensors(fiber optics, mems
b.Intellectual Skills: :	
1 -	b1. Select suitable sensors based on function, performance
2 -	b2. Select the suitable A/D and D/A converters.
c.Professional and Practical Skills: :	
1 -	c1. Use sensors and signal conditioning in mechatronics systems.
d.General and Transferable Skills: :	
1 -	d1. Collaborate effectively within multidisciplinary team
2 -	d2. Effectively manage tasks, time, and resources.

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3 -	d3. Search for information and engage in life-long self-learning discipline

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction		2	1
Position & speed measurements		2	1
Stress and strain measurements		2	1
Temperature measurements		2	1
Vibration and Acceleration Measurement		2	1
Pressure and flow Measurements		2	1
Semiconductor sensors and Microelectromechanical devices.		4	2
Analog interfacing		5	3
Data Acquisition Systems		5	2
New trends		4	2

Teaching And Learning Methodologies :

Interactive Lecturing
Brain Storming
Discussion
Experiential learning
Project
Research

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
1st Midterm	15.00	6	
2nd Midterm	15.00	11	
Assignments, Participation, & Quizzes	20.00		
Course Project	10.00	12	
Final Exam	40.00		

Recommended books :

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1. Text Book:
Alciatore, David G.& Histand, Michael B.; ñIntroduction to Mechatronics and Measurement Systemò, McGraw Hill, Latest editions.
Bolton, William; ñMechatronics: Electronic Control Systems in Mechanical and Electrical Engineeringò, Prentice Hall, Latest editions
2. Lecture notes and videos on the course Moodle page, FUE website

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