

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
Lecturer	Mohamed Ali Mohamed Elsayed Torad	2
Teaching Assistant	Osama Ahmed Ibrahim Mohamed Montaser	

Area Of Study :

This course aims to:

^{*A*} Antroduce sensors and transducers as main elements in Mechatronics systems.

"Ænrich the students basic knowledge about signal conditioning units to prepare signals to be suitable for next stage.

Ärain 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.Knowled	ge 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.Intellect	ual Skills: :		
1 -	b1. Select suitable sensors based on function, performance		
2 -	b2. Select the suitable A/D and D/A converters.		
c.Professi	onal and Practical Skills: :		
1 -	c1. Use sensors and signal conditioning in mechatronics systems.		
d.General	d.General and Transferable Skills: :		
1 -	d1. Collaborate effectively within multidisciplinary team		
2 -	d2. Effectively manage tasks, time, and resources.		



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

Course Topic And Contents :			
Торіс	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 :

1. Text Book:

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^{*A*}Bolton, William; Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering APrentice Hall, 4th Edition, 2008

2. Lecture notes and videos on the course Moodle page, FUE website.

