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:
ÅIntroduce sensors and transducers as main elements in Mechatronics systems.
Å Enrich the studentôs basic knowledge about signal conditioning units to prepare signals to be suitable for next stage.

ÅTrain 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.

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 :

1. Text Book:
ÅAlciatore, David G.& Histand, Michael B.; ñIntroduction to Mechatronics and Measurement Systemò, McGraw Hill, 4th Edition, 2012
ÅBolton, William; ñMechatronics: Electronic Control Systems in Mechanical and Electrical Engineeringò, Prentice Hall, 4th Edition, 2008
2. Lecture notes and videos on the course Moodle page, FUE website.