FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Introduction to Micro- Elector Mechanical Systems (MEMS)

Information :

Course Code :	MKT 507	**Level :**	Undergraduate	**Course Hours :**	2.00- Hours
Department :	Specialization of Mechatronics Engineering				

Area Of Study :

Enrich the studentõs understanding of the Micro Systems and their working principles
Develop the studentõs ability to apply the different design principles on different micro devices.
Enrich the students understanding of micro-systems fabrication processes.

Description :

Overview of micro-systems, common micro-systems and their working principles, mechanical modeling and simulation of MEMS, scaling laws in miniaturization, material for MEMS and micro-systems, mechanical design of micro devices, mechanical packaging of micro devices, overview on micro-systems fabrication processes.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Understand the different fabrication processes involved in MEMS fabrication.
2 -	Comprehend the different factors and principles associated with the design of a microsystem.
3 -	Understand the different working principles of the common microsystems.
b.Intellectual Skills: :	
1 -	Analyse the different working principles and fabrication processes on a specific device from literature in term project
2 -	Apply the different fabrication process on several MEMS sensors and actuators.
3 -	Analyse the forces and design principles on different MEMS devices.
c.Professional and Practical Skills: :	
1 -	Present a technical report on a specific MEMS sensor or an actuator.
2 -	Review literature to analyze different working principles and fabrication processes on a specific device in term project
d.General and Transferable Skills: :	
1 -	Present the project in a technical report and power point presentation.
2 -	Submit on time assignments and project.
3 -	Review different sources of literature for term project.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Course Outline Overview of MEMS and Microsystems	4	2	2
Working Principles of Microsystems	8	4	4
Engineering Science for Microsystems Design and Manufacturing	4	2	2
Engineering Mechanics for Microsystem Design	8	4	4
Scaling Law in Miniaturization	4	2	2
Materials for MEMS and Microsystems	4	2	2
Microsystems Fabrication Processes	6	4	4
Overview of Micromanufacturing	4	2	2

Teaching And Learning Methodologies :

Interactive Lecturing
Problem solving
Project

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
1st Midterm	15.00	6	
2nd Midterm	15.00	11	
Attendance and class participation	10.00		
Final Exam	40.00	16	
Project	20.00	14	