



**Faculty of Engineering – Assiut University**  
**Bachelor Degree**  
**Mechanical Engineering Department**  
**Mechatronic Engineering Program**  
**Course specification**  
**Mechatronics (A) MT 423**

### 1. Course Aim

<b>Main Aim</b>	At the end of this course the student will be able to Introduce basic concepts and theory of mechatronics Systems.
<b>Sub-Aims</b>	<ul style="list-style-type: none"><li>• Presenting a clear definition of mechatronics and mechatronics systems.</li><li>• Understanding the main characteristics of mechatronics systems.</li><li>• Being able to model and simulate different mechatronics systems.</li><li>• Being familiar with main components of a mechatronics system.</li><li>• Being familiar with the role of sensors and actuators in a mechatronics system.</li><li>• Having a clear understanding of the role of control in mechatronics.</li><li>• Being familiar with the function of a microprocessor/microcontroller in a mechatronics system.</li></ul>

### 2. Course Content

Introduction to Mechatronics - Mechatronics Definition - Mechatronics Design Versus Traditional Design - Examples of Mechatronic Products - Role of modelling in Mechatronics- Mechatronics sensors – Mechatronics actuators – Role of control in Mechatronics – Microcontrollers/microprocessors in Mechatronics - Case Studies on Mechatronics Systems

(Reference: Faculty bylaw 2004 – program specification)

<b>3. Course Topics</b>		
<b>Topic</b>	<b>Subject</b>	<b>weeks</b>
<b>1<sup>st</sup> topic</b>	Introduction to Mechatronics	1
<b>2<sup>nd</sup> topic</b>	Role of modeling in Mechatronics	2
<b>3<sup>rd</sup> topic</b>	Mechatronics sensors	3
<b>4<sup>th</sup> topic</b>	Mechatronics actuators	3
<b>5<sup>th</sup> topic</b>	Role of control in Mechatronics	2
<b>6<sup>th</sup> topic</b>	Microcontrollers/microprocessors in Mechatronics	2
<b>7<sup>th</sup> topic</b>	Cases Studies on Mechatronics Systems	2

<b>4. Grades Distribution</b>			
<b>Assesment Methods</b>		<b>Percentage</b>	
<b>Final Exam</b>		60%	
<b>Final Oral Exam</b>		16%	
<b>Med term exam 1</b>		8%	
<b>Med term exam 2</b>		8%	
<b>Assessments</b>	<b>Written Exam</b>		8%
	<b>Oral Exam</b>		
	<b>Tutorial assessment</b>		
	<b>Project assessment</b>	5%	
	<b>Model assessment</b>		
	<b>Report assessment</b>		
	<b>Quiz assessment</b>		
	<b>Presentation assessment</b>	2%	
	<b>Discussion</b>	1%	
	<b>Laboratory test</b>		
	<b>Home Exam</b>		
	<b>Monitoring</b>		
<b>Total</b>		100%	

## 5. List of References

### 5.1- Reference Book:

Introduction to Mechatronics notes, HEEPF grant (A-085-10)

### 5.2- Recommended Books:

- Kent Stiffler, “Design with Microprocessors for Mechanical Engineers”, McGraw Hill, 1992.
- Christopher Kilian, “Modern Control Technology: Components and Systems”, Delmar Thomson Learning, 2nd Ed., Dec. 2000.
- N. Mahalik, “Mechatronics: Principles, Concepts and Applications”, Tata McGraw-Hill, 2003.