



Arab Academy for Science, Technology & Maritime Transport  
College of Engineering & Technology  
Mechanical Engineering (Mechatronics) Program

**University/Academy:** Arab Academy for Science, Technology & Maritime Transport  
**Faculty/Institute:** College of Engineering & Technology  
**Program:** B.Sc. Mechanical Engineering

**Form no. (12)**  
**Course Specification**

**1- Course Data**

Course Code: <b>ME 592</b>	Course Title: <b>Mechatronics Systems</b>	Academic Year/Level: <b>5th year / 9th semester</b>
Specialization: <b>Mechanical</b>	No. of Instructional Units <b>3 credits</b>	Lecture <b>2 hrs.</b>
		Practical <b>2 hrs.</b>

**2- Course Aim**

- Understand and analyze the Mechatronics systems
- Introducing the key elements, techniques, control, and design process user for Mechatronics system design
- Study the important components Data Acquisition Systems (DAS).

**3- Intended Learning Outcomes**

<b>z- Knowledge and Understanding</b>	<b>Through knowledge and understanding, students will be able to:</b> K15 ME) The principles of sustainable design and development
<b>aa-Intellectual Skills</b>	<b>Through intellectual skills, students will be able to:</b> I13 ME) Identify at an appropriate level the design, production, interfacing and software needs of different parts of Mechatronics systems.
<b>bb- Professional Skills</b>	<b>Through professional and practical skills, students will be able to:</b> P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, Products and/or services P3) Create and/or re-design a process, component or system, and carry out specialized engineering designs P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results P13 ME) Compete, in-depth, in at least one engineering discipline, namely mechanics, electronics or Interfacing and software P16 ME) Apply the principles of sustainable design and development.
<b>cc- General Skills</b>	<b>Through general and transferable skills, students will be able to:</b>

**4- Course Content**

<b>Week No.1</b>	Introduction to Mechatronics Systems
<b>Week No.2</b>	Mechatronics of System Performance
<b>Week No.3</b>	Computer Control

<b>Week No.4</b>	Z-transform
<b>Week No.5</b>	Discrete Controllers I
<b>Week No.6</b>	Discrete Controllers II
<b>Week No.7</b>	7th week exam / 7th week evaluation
<b>Week No.8</b>	Interfacing Sensors and Actuators to Computer
<b>Week No.9</b>	Real-Time Interfacing
<b>Week No.10</b>	Computer I/O Cards and Software I
<b>Week No.11</b>	Computer I/O Cards and Software II
<b>Week No.12</b>	12th week exam / 12 <sup>th</sup> week evaluation
<b>Week No.13</b>	Data Acquisition and Control Case Studies.
<b>Week No.14</b>	Liquid Level Control
<b>Week No.15</b>	Robotics Applications
<b>Week No.16</b>	Final Examination

**5- Teaching and Learning Methods**

- Lectures
- Tutorials
- Reports & sheets
- Laboratories
- Seminars

**6-Teaching and Learning Methods for Students with Special Needs**

- Lectures
  - Tutorials
  - Reports & sheets
  - Laboratories
  - Seminars
- Academic Support:**
- The general academic advisor appoints an academic supervisor for handicapped students.
  - Continuous follow ups are made for handicapped students after each assessment to evaluate their academic level of achievement

**7- Student Assessment**

<b>a-Procedures used</b>	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, -----) to assess The Intellectual Skills.	
<b>b- Schedule:</b>	Assessment 1 Assessment 2 Assessment 3 Assessment 4	7 <sup>th</sup> Week Assessment 12 <sup>th</sup> Week Assessment Continuous Assessments 16 <sup>th</sup> Week Final Written Exam
<b>c- Weighing of Assessment</b>	7 <sup>th</sup> Week Evaluation 12 <sup>th</sup> Week Evaluation Final-term Examination Oral Examination Practical Examination Semester Work Total	30 % 20 % 40 % 00 % 00 % 10 % 100%

**8- List of References:**

<b>a- Course Notes</b>	N/A
<b>b- Required Books (Textbooks)</b>	• CARRYER, J.E. OHLIN, R.M. " INTRODUCTION TO MECHATRONICS DESIGN"
<b>c- Recommended Books</b>	<ul style="list-style-type: none"> <li>• J.E.Carryer, R.M.Ohline, and T.W.Kenny, ” Introduction to Mechatronic design”, Latest Edition, PEARSON Publishing Company.</li> <li>• J.P. Holman, W.J.Gaida, “Experimental Methods for Engineer”, McGraw Hill, Latest Edition.</li> <li>• M.B.Histand &amp; D. G. Alciatore” Introduction to Mechatronics and Measurement Systems”, McGraw-Hill, Latest Edition</li> </ul>
<b>d- Periodicals, Web Sites, etc.</b>	N/A

**Course coordinator:**

**Program Manager:**