



# Philadelphia University

Faculty of Engineering and Technology,  
Department of Mechatronics Engineering.  
Course Syllabus, Second Semester, 2018/2019

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## Course Details:

**Title:** Mechatronic Systems Design (0640447).  
**Prerequisite:** Automatic Control and Microcontroller Systems.  
**Credit Hours:** 3-credit hours (16 weeks per semester, approximately 45 contact hours).  
**Textbook:** *Mechatronics: An integrated Approach* by Clarence De Silva. CRC Press 2005.

## **References:**

- Mechatronics System Design 2nd edition by Shetty and Kolk. Cengage Learning 2011
- Mechatronics Handbook. Edited by Bishop. CRC Press. 2002
- Modern Control Technology: Components and Systems 2nd edition by Kilian. Delmer Publication 2005.
- Mechatronics and Measurement System 4th edition by Alciatore and Histan 2012
- System Dynamics for Engineering Students: Concepts and Applications by Lobontiu. Elsevier Publication 2010
- Mechatronic Systems: Fundamentals by Rolf Isermann. Springer 2005
- Fundamentals of Mechatronics by M. Jouaneh. Cengage Learning 2013

**Website:** <http://www.philadelphia.edu.jo/academics/malkhawaldeh/>

**Instructor:** Dr. Mustafa Awwad Al-Khawaldeh  
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**Office hours:** *Sunday, Tuesday, and Thursday: 11:10-12:00* ,  
Monday, Wednesday: *10:00-11:000*

### Course Outlines:

Week	Topic	Assignments
1	Mechatronic System Overview	
2	Mechatronic Design Approach	
3	Modeling and Simulation	Project Selection
4	Simulation and Analysis: MATLAB	
5	Sensors: Overview	
6	Transducers: Overview	
7	Sensors: Selection Criteria	
8	Actuating Devices: Overview	
9	Actuating Devices: Selection Criteria	Project Simulation
10	Actuating Devices: Selection Criteria	
11	Drive Circuits	
12	Control Systems	
13	Control Simulation: MATLAB	
14	Mechatronic System Design: Case Studies	
15	Review	Project Report
16	Project Presentation	

### Course Learning Outcomes with reference to ABET Student Outcomes:

Upon successful completion of this course, student should:

1.	Understand requirements and specifications of mechatronic systems.	[1]
2.	Model and simulate simple mechatronic systems using MATLAB.	[1,2,6]
3.	Evaluate suitable actuators and sensors for a mechatronics application	[1 , 2]
4.	Calculate the power requirements for mechatronic drive systems	[2]
5.	Write technical reports following a well-defined design procedure	[3, 5, 6]

### Assessment Guidance:

Evaluation of the student performance during the semester (total final mark) will be conducted according to the following activities:

**Sub-Exams:** The students will be subjected to two scheduled written exams, first exam and second exam during the semester. Each exam will cover materials given in lectures in the previous 3-4 weeks.

**Quizzes:** 2-quizzes of 10-minutes will be conducted during the semester.

**Homework and projects:** Tutorials sheets will be handed out to the students and homework should be solved individually and submitted before or on a set due date. Student may be assigned to present project(s).

**Grading policy:**

First Exam	20%
Second Exam	20%
Quizzes, projects and Homework	20%
Final Exam	40%
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Total:	100%

**Attendance policy:**

The semester has in total 45 credit hours. Total absence hours from classes and tutorials must not exceed 15% of the total credit hours. Exceeding this limit without a medical or emergency excuse approved by the deanship will prohibit the student from sitting the final exam and a zero mark will be recorded for the course.