Hashemite University
College of Engineering
Department of Mechatronics
Design of Mechatronics Systems 110405542
(3 Credit Hours)[1]

Instructor

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Office hours:	S T Th 11:00 am – 12:00 pm.

Grading info

Test 1	**30**
Project	**15**
Others	**15**
Final	**40**

Class Info

Days	Sun, Tue, Thu
Time	12:00– 13:00
Location	E2023

Course

Course Number:	**110405542**
Prerequisite:	11040533, 110405323, 110405431
Textbook:	Shetty, Devdas, and Richard A. Kolk. *Mechatronics System Design, SI Version*. Cengage Learning, 2011.
Course Description (as in the catalog):	This course aims to provide students a background on mechatronics systems design by utilizing their knowledge in mathematical modeling, computer simulation and control analysis of mechatronics systems. The course includes a comprehensive projects where the students try to combine their skills in electrical, mechanical and computer technologies to produce functional mechatronics systems.
Specific Outcomes of Instruction (Course Outcomes):	The student in this course should be able to: 1. Build a detailed block diagram model for real time simulations. (Outcome A and E) 2. Implement electromechanical systems in Simulink models. (Outcome A, F, and K) 3. Examine control theories on mechatronics systems to achieve best performance. (Outcome A, E, and K) 4. Employ sensors and actuators properly in mechatronics applications.(Outcome A, C, and E) 5. Design a mechatronics system in a team work for a useful application. (Outcome A, C, E, F, G, H, and K)
Important material	Slides will be available online

References:

1. Janschek, Klaus. *Mechatronic systems design: methods, models, concepts*. Springer Science & Business Media, 2011.
2. "MECHATRONICS", Clarence W. de Silva

Major Topics Covered and Schedule in Weeks:

Topic	# Weeks	# Contact hours
1. Introduction to mechatronics (Chapter 1)	1	3
2. Modelling of physical systems (Chapter 2) 3. Simulink	2,3	6
4. Actuators (Chapter 4)	4,5	4
5. Control system design and implementation (Chapter 6) 6. Simulink	5,6	5
7. Case study	7	3
8. Midterm Exam	8	1
9. Sensors and transducers (Chapter 3) 10. Sensors applications	8,9,10	8
11. Real-time interfacing (Chapter 7)	11	3
12. Case study	12	3
13. Student projects (full mechatronics design)	13,14,15	9
Total	**15**	**45**

Course Policy

- **Attendance**: Anyone who has more than five class-long, unexcused absences will receive an "F" grade for the COURSE.
- **Quizzes**: There will be no make-up quizzes. Quizzes will be given only to those students who are present when the quizzes are passed out.
- Assignment must be turned in during lecture, or into my mailbox on the due date. Late assignments lose 30% of the mark on each day after the due date

Student Outcomes (SO) Addressed by the Course:

#	*Outcome Description*	*Contribution*
(a)	an ability to apply knowledge of mathematics, science, and engineering	***M***
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	***H***
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	***M***
(f)	an understanding of professional and ethical responsibility	***L***
(g)	an ability to communicate effectively	***L***
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	***L***
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	***L***

H=High, **M**= Medium, **L**=Low