



Hashemite University
College of Engineering
Department of Mechatronics
Control and Transducers Lab 110405432
(1 Credit Hours)

Instructor

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Office hours:	As Attached

Grading info

Mid Test	20 (Monday 4/3/2019)
Reports and Quizzes	40
Final	40 (8/4/2019)

Class Info

Days	Mon, Tues
Time	02:00-05:00
Location	E2071

Course

Course Number:	110405432
Prerequisite:	110405431
Textbook:	Control and Transducers Laboratory Manual
Course Description (as in the catalog):	The aim of this laboratory is to provide students with a thorough understanding of control systems, their components and their applications in addition to measurement and signal conditioning system design. Study includes sensors for measurement of temperature, displacement, stress/strain and light.
Specific Outcomes of Instruction (Course Outcomes):	The student shall be able to: <ol style="list-style-type: none"> 1. List and use components required to build a servo control system (Outcome “b”). 2. Apply and analyze the characteristics and performance of 1st and 2nd order control system in open and closed loop control forms (outcomes “b”, “e” and “k”). 3. Demonstrate the effects of a variety of controllers on performance of control system (outcomes “b”, “e” and “k”). 4. Employ different types of thermal and mechanical sensors in measurement systems (Outcomes “b” and “e”). 5. Design an experiment according to certain requirements (Outcome “b”).
Important material	

References:

1. Dorf, Bishop (2001), Modern Control Systems, 11th Edition, Prentice Hall.
2. Curtis D. Johnson (2003), Process Control Instrumentation Technology, Seventh Edition, Prentice Hall.

Major Topics Covered and Schedule in Weeks:

Topic	# Weeks	# Contact hours
Servo Control System	2	3
Response of 1 st and 2 nd ordered systems	3	3
Characteristics of Open & Closed Loop Control System	4	3
PID Controller	5	3
Root locus design	6	3
Proximity sensors	7	3
Midterm Exam	8	1
Thermal Sensors	9	3
Thermal Sensors	10	3
Position Sensors	11	3
Position Sensors	12	3
Final Exam	13	1

Total	12	32
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Course Policy

- Respect.
- Internal transfer is not allowed.
- Be on time (2:00)
- Noise must be kept to a zero
- Passing Grade: 50%
- No Make up for missing neither midterm exam nor quizzes even excuse is acceptable.
- Cheating and copying is not tolerated. Taking figures from your partner will be considered as copying.
- التعويض مسموح بعد أخذ الموافقة المسبقة من عضو هيئة التدريس المسؤول عن المختبر والدكتور منسق المختبر وذلك بعد تقديم عذر مقبول
- التعويض يتم خلال نفس الأسبوع الذي يغيب فيه الطالب/الطالبة. ولن يتم التعويض بأي حال من الأحوال بعد تجاوز الأسبوع الذي يتم فيه اجراء التجربة لكل الشعب.
- Hard copy of experiments manual and cover sheets for reports are available at the copying center.
- Expect a quiz at the beginning of each lab session (regardless other sessions schedule)
- For each experiment, a lab sheet (i.e. a report) should be submitted at the end of the experiment session. Late reports are allowed.
- Attendance is mandatory. Missing two lab sessions will prohibit student from attending final exam.
- Students should formulate groups of 2 or 3 only. A group of 4 is not allowed.
- Workspace must be kept clean and tidy at all time. Before you leave, turn off equipment. Grade will be deducted from the report grades.
- No items should be taken from the lab.
- Handle all equipment with care.
- A student is liable for any damage to equipment due to their own negligence and ignorance.
- All students must work. Just watching other working is not acceptable.
- Consult the lab supervisor if you are not sure how to operate any equipment.
- It is the student's responsibility to manage his/her time in the lab (certain tasks are to be done within specific periods), what data to record and measure, and what the next step is. The job of the instructors is to provide support only. Reading manual is enough to get a complete idea about experiments and measurements.
- No cell phones in lecturers and exams.
- No smart devices in exams.
- No calculator exchange

#	Outcome Description	Contribution
(a)	an ability to apply knowledge of mathematics, science, and engineering	
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	H
(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	
(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	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(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	M

H=High, M= Medium, L=Low