



Philadelphia University
Faculty of Engineering - Department of Mechatronics Engineering
Course Syllabus

Course Details:

Course Title: Automatic control Lab (0640442), Fourth year
Prerequisite: Automatic control (0640334)
Credit Hours: 1 credit hours (14 weeks per semester, approximately 28 contact hours)

Textbook: Laboratory notes and manual

References: 1. R.C. Dorf & R.H. Bishop, "Modern Control Systems", 12th Edition, Prentice Hall, 2011.
2) K. Ogata, "Modern Control Engineering", 4th Edition, Prentice Hall, 2010.

Course Description:

1. To introduce the principle of control theory
2. Learn about the control systems used and realize the differences between the closed loop and open loop system.
3. Get the knowledge in closed loop systems and the effective parameter to improve the system response.
4. Introduce the principle of the servo control valve.
5. Study the position and speed control of pneumatic actuators
6. Study the pressure control in pneumatic system.
7. A knowledge of designing open loop and closed loop control system with emphasis on stability of the system ,Applying different controller's structures for processes with disturbance

Website: <http://www.philadelphia.edu.jo/academics/waraydah/page.php?id=3>

Instructor: **Email:** waraydah@philadelphia.edu.jo
Office: Engineering building, Mechatronics Department, room 64212, ext: 2591.
Office hours: Sun, Tues, Thurs: 11:15-1:15

Lab Experiments:

Week	Experiment Name
1	Introduction
2	Introduction to Servo Control Valves
3	Acceleration and Deceleration Control
4	Open-Loop Position Control
5	Closed-Loop Position Control, Proportional Mode
6	Closed-Loop Position Control, Proportional-Plus-Integral Mode
7	Open-Loop Speed Control (Pneumatic motor)
8	Closed-Loop Speed Control, Proportional-Plus-Integral-Plus-Derivative Mode
9	Closed-Loop Pressure Control, Proportional-Plus-Integral Mode
10	Closed-Loop Speed Control, Proportional-Plus-Integral-Plus-Derivative Mode (DC motor)

11	Control Tutorials for MATLAB
12	MATLAB with Arduino
13	Introduction to LabVIEW and Data Acquisition System
14	Final Exam

Course Learning Outcomes with reference to ABET Student Outcomes:

Upon successful completion of this course, student should:

1.	Understand the operational amplifier characteristics and how to use it in practical control systems	[1]
2.	Understand the basic difference between open and closed loop control systems	[1]
3.	Ability to implement controller design techniques to make the system behavior satisfy design objectives	[6]

Assessment Guidance:

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

Quizzes: (3-5) quizzes of (10-15) minutes will be conducted during the semester. The materials of the quizzes are set by the lecturer.

Reports: 11 report.

Final Exam: The students will undergo a scheduled final exam at the end of the semester covering the whole materials taught in the course.

Grading policy:

Reports	40%
Quizzes	20%
Final Exam	40%
Total:	100%

Attendance Regulation:

The semester has in total 28 credit hours. Total absence hours from classes 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. If the excuse is approved by the deanship the student will be considered withdrawn from the course.