Philadelphia University

Faculty of Engineering and Technology
Mechatronics Engineering Department
First Semester 2019/2020

Course Details:

Title:	Pneumatic and Hydraulic Systems (640435)
Prerequisite:	Automatic Control (640344) + Thermo Fluid (640335)
Credit Hours:	3 credit hours (16 weeks per semester, approximately 45 contact hours)
Textbooks:	"Fluid Power: Hydraulics and Pneumatics" James Daines, 2nd edition, 2011. "Fluid Power with Applications" Anthony Esposito, Prentice-Hall International, 7th edition 2008.
References:	• "Fluid Power Hydraulics" Johnson and Robert Kresses, 1982 • "Power Hydraulics" J. Ashby, Prentice Hall, 3rd edition, 2000
Description:	The course provides the student with different theories, components, and applications of hydraulic and pneumatic power control systems.
Website:	http://www.philadelphia.edu.jo/academics/inaimi
Instructor:	Dr. Ibrahim Al-Naimi **Email**: inaimi@philadelphia.edu.jo **Office**: Engineering building, room 6410, ext: 2124 **Office hours**: Sunday, Tuesday, and Thursday: 9:10-10:00 and 11:10-12:00

Course Outlines:

Week	Topic
(1)	Introduction of fluid power
(2)	Pneumatic characteristics and applications
(3, 4)	Air generation, treatments and distribution
(5, 6)	Pneumatic actuators
(7)	Input, control, and processing elements
(8, 9)	Pneumatic system design and development
(10, 11)	Hydraulic characteristics and applications
(12)	Hydraulic generation treatments and distribution
(13)	Hydraulic actuators
(14)	input, control, and processing elements
(15, 16)	Hydraulic system design and development

Course Learning Outcomes with reference to ABET Student Outcomes:

Upon successful completion of this course, student should:

1.	Understand the principles of the fluid power systems	[1]
2.	Understand the main components of the fluid power systems	[1, 2]
3.	Read, analyze and troubleshoot hydraulic, pneumatic, electrohydraulic and electropneumatic circuits.	[1, 2, 6]
4.	Design fluid power systems	[1, 2, 6]

Assessment Guidance:

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

Project: A project assignment will be handed to the students. The assignment will ask the students to design, simulate, and build a simple electro-pneumatic or electro-hydraulic system. Students will be evaluated according to their in-lab circuit testing, analytical thinking, and report writing. A group of two students are expected to work on this project.

Lecture: Contemporary selected topics in power fluids will be handed to the students. The students should study the topic, write a technical report, prepare a power point presentation, and give an in-class lecture.

Home Work: Several problems in hydraulic circuits will be handed to the students to perform analytical calculations, determine the required component specifications, and select the proper components type and size.

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:

Project	20%
Lecture	20%
Home Work	20%
Final Exam	40%
Total:	100%

Attendance Regulation:

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. If the excuse is approved by the deanship the student will be considered withdrawn from the course.

October, 2019