Philadelphia University

Faculty of Engineering – Mechatronics Engineering Department

Course Details:

Title:	**Pneumatic and Hydraulic Systems** (640435)
Course type:	Elective
Prerequisite:	Programmable logic controllers (0640445)
Credit Hours:	3 credit hours (15 weeks per semester, approximately 44 contact hours)
Textbook:	"Fluid Power with Applications" By Anthony Esposito, Prentice-Hall International, 7th edition 2014.
References:	• Fluid Power Hydraulics by Johnson, Robert Kresses 1982 • Power Hydraulics by 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.

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)	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 and the main components of the fluid power systems	[1]
2.	Read and analyse hydraulic, pneumatic, electrohydraulic and electropneumatic circuits.	[1]
3.	Design fluid power systems	[2]

Assessment Guidance:

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

Exams: The students will be subjected to one scheduled written exam, during the semester. It will cover materials given in the first eight weeks.

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

project: A project assignment will be handed to the students. The assignment will ask the students to design, simulate, and build an 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 three students are expected to work on the project.

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:

Mid Exam	30%
Quizzes, project, and participation	20%
Final Exam	50%
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.