

# Syllabus **ME 421-3** Pneumatic Hydraulic Engineering.

Fall 2014, 9:00 - 9:50 AM, ENGA - 208

**Instructor:** Dr. Marek L. Szary, ENGB-0120, ph. 453-7833, szary@engr.siu.edu,  
Office hours: 10:00 -11:00 on M-W-F and 15:00 – 16:00 on Tu and Th.

## Course Information

### Overview of the course:

Design principles of fluid power engineering. The behavior of fluids in a system. Analysis and design of hydraulic and pneumatics machinery and systems using fluid as a medium for transmission of power and control of motion. Analysis of steady state and dynamic behavior. Critical operations and analysis.

**Prerequisites:** Fluid Mechanics with a grade of C or better.

**Textbook:** Anthony Esposito, *Fluid Power with Applications*. Fifth Edition. Prentice Hall. ISBN 0-13-010225-3

**Grading:** There will be two tests, one final exam and laboratory final. Homework assignments, quizzes and laboratory reports are also graded and counted toward the final grade.

Distribution is as follows:

2 tests – 15% each.....	30%
1 final exam.....	15%
Homework assignments.....	10%
Quizzes.....	15%
Laboratory.....	30%
Total.....	100%

The final grade will be assigned based on the standard SIU distribution:

100%-90% = A

89%-80% = B

79%-70% = C

69%-60% = D

Below 60% = F

### **Rules:**

\* All necessary free body diagrams and calculations must be clearly shown on all graded work in order to receive full credit.

\*All written material must be legibly hand-written or double-spaced type written.

\*No makeup exams will be given. If you know ahead of time that you will miss an exam for some reason, let me know and I may give you an exam early.

\*The final exam will be comprehensive.

\*Students are expected to be regular and punctual in class attendance. The University believes that students themselves are primarily responsible for attendance, however, excessive or extended absence from the class and or low grades are sufficient reason for the instructor to advise student to drop the course.

## **TENTATIVE TOPIC OUTLINE**

<b>No.</b>	<b>Class time allotted (weeks)</b>	<b>Topics</b>
I.	0.5	Introduction.
II.	1.0	Basic principles of hydraulics and pneumatics
III.	0.5	Fluids for hydraulics power.
IV.	1.0	Linear hydraulic circuit. System components and basic circuits.
V.	1.0	The distribution and source of hydraulics/pneumatic power.
VI.	1.0	Review and TEST #1
VII.	1.5	Pumps, classification, theory of pumping.
VIII.	1.0	Control of hydraulic/pneumatic power.
IX.	1.5	Motors and actuators.
X.	1.0	Hydraulic/pneumatic advanced systems
XI.	1.5	Review and TEST #2
XII.	1.0	The compressed air systems

XIII.	1.5	Hydraulic/pneumatic logic control
XIV.	1.0	Review and FINAL.

The allotted time during the Summer Semester should be reduced by the factor of 2.