1. ME 4232, Fluid Power Control Lab

2. 4 credits, 6 contact hours.

3. Instructors: P. Li, K. Stelson, J. Van de Ven


5. Specific Course Information:
   b. Prerequisites: ME 4031W, ME 3281.
   c. Elective for ME students.

6. Course outcomes (related ABET student outcomes indicated in square brackets):
   a. A familiarity with basic types of hydraulic components, their construction, characteristics and use. [1]
   b. An ability to develop mathematical models of hydraulics components and circuits. [1]
   c. An ability to use software tools to analyze and simulate dynamic systems. [1,2]
   d. A knowledge of components necessary to implement control systems. [1,2]
   e. An ability to apply dynamic systems concepts to real hydraulic systems. [1,2]
   f. A knowledge of methods for identifying an unknown dynamical system. [1,6]
   g. An ability to design, analyze and implement various types of controllers. [1,2]
   h. A knowledge of basic laboratory components and instrumentation for hydraulic systems. [6]
   i. An ability to design and implement appropriate experiments involving hydraulic systems. [1,2,6]
   j. An ability to succinctly present findings and interpretations of experimental results. [3,6]
   k. An ability to work in teams. [5]

7. Course topics:
   a. Principles of hydraulics
   b. Overview of hydraulic components
   c. Modeling and analyzing hydraulic components and circuits
   d. Component sizing
   e. System identification techniques
   f. Analysis and design of Proportional, Proportional-Integral, Feedforward, and Internal Model Principle controllers
   g. Modeling and simulating hydraulic components and circuits using software tools
   h. Implementing hydraulic circuits in hardware