COURSE SYLLABUS
MFG 220
FLUID POWER
3 Semester Hours

Spring 2009

Faculty: Sheila Bradley
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Office Hours: By appointment
Class Time: Lecture: Tuesday, 5:00 – 7:00 p.m. AAB 306
Lab: Tuesday, 7:15 – 10:15 p.m. AAB 306

COURSE DESCRIPTION
This course covers the physical principles and measurements of fluid mechanics as it applies to
the design and analysis of the hydraulic and pneumatic systems used in engineering and
manufacturing. The focus of this course is on the application of fluid power components such as
pumps, valves and actuators, and the circuits used in machinery. Topics include fluid statics,
fluid motion, internal, external and compressible flow, and environmental fluid mechanics. Open
channels, pipe systems and fluid transients are also covered. Corequisites: MFG 110 and MFG
150 or permission of the department head. This course is usually offered in the spring.

Textbook:
Laboratory exercises will be supplemented with teacher provided materials
Software: Lab Volt simulation software

COURSE OBJECTIVES, ASSESSMENT GOALS AND ASSESSMENT STRATEGIES

1. Explain the definition of Fluids and Fluid Power Systems in everyday life
   The student will participate in a lecture and view a film of fluids
   The student will complete a quiz for competency
   Assessment Strategy: Exam questions, quizzes and homework. *

2. Explain the definition of Pascal’s Principle and how it applies to fluids.
   The Student will participate in a lecture and complete a lab on the LabVolt trainer on the above.
   The student will complete a quiz for competency of Pascal’s Principle
   Assessment Strategy: Exam questions, quizzes and homework. *

3. Describe a closed looped system and its characteristics and components.
   The Student will participate in a lecture and complete a lab on the LabVolt trainer on the above.
   The student will complete a quiz for competency
   Assessment Strategy: Exam questions, quizzes and homework. *
4. Describe the function of manometer, barometers, and hydrometers in fluid power systems.
   Student will participate in a lecture and complete a lab on the LabVolt trainer.
   The student will complete a quiz for competency
   Assessment Strategy: Exam questions, quizzes and homework. *

5. Describe an open looped systems and its characteristics and components
   The Student will participate in a lecture and complete a lab on the LabVolt trainer on the above.
   The student will learn how to use the Thomas Registry through an assignment.
   The student will complete a quiz on open looped systems for competency
   Assessment Strategy: Exam questions, quizzes and homework. *

6. Explain types of flows and know how Bernoulli’s equation is used to solve problems
   The Student will participate in a lecture and complete a lab on the LabVolt trainer on the above.
   The student will complete a quiz on types of flows for competency
   Assessment Strategy: Exam questions, quizzes and homework. *

7. Know the hydraulic system components and function, including drawing symbols.
   The Student will participate in a lecture and complete a lab on the LabVolt trainer on the above.
   The student will complete a quiz on hydraulic system components for competency
   Assessment Strategy: Exam questions, quizzes and homework. *

8. Know the basic circuits of fluid power
   The student will complete a computer learning program module (Virtual Laboratory) on the above
   The student will complete a quiz on basic circuits for competency
   Assessment Strategy: Exam questions, quizzes and homework. *

9. Explain the difference of pneumatic power systems
   The Student will participate in a lecture and complete a lab on the LabVolt trainer on the above.
   The student will complete a quiz on pneumatic power systems for competency
   Assessment Strategy: Exam questions, quizzes and homework. *

10. Describe the various control components of fluid power systems
    The Student will participate in a lecture and complete a lab on the LabVolt trainer on the above.
    The student will build a fluid power circuit with as many components as possible and report on it.
    The student will complete a quiz on control components for competency
    Assessment Strategy: Exam questions, quizzes and homework. *

*Note: Assessment Strategy - There is a required Graded internet assignment

Electronic Assignment
Students are required to complete an electronic assignment, written based on the information sheet given out on Wk 1. The material must be located using electronic media either in the school or from your home. A specific requirement of the electronic project is to cite and list the electronic media used in the paper at the bottom of your report. The report must be in your own words. You are allowed to paraphrase, restate and summarize articles you review. A student who does not turn in this assignment cannot receive an “A” grade. The student may not copy paragraphs verbatim without restatement. The assignment is due on Week 11.

No electronic assignment will be accepted after the due date.

Grading/Exams:
Grading will be determined on the basis of tests, reading assignments, homework assignments, quizzes, Electronic Library project, laboratory assignments, projects and final exam. This course will include a comprehensive final exam. Final grade will be weight as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class work</td>
<td>15%</td>
</tr>
<tr>
<td>Competency Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>Two Exams</td>
<td>20%</td>
</tr>
<tr>
<td>Lab Assignments</td>
<td>30%</td>
</tr>
<tr>
<td>Electronic Library Project</td>
<td>10%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>15%</td>
</tr>
</tbody>
</table>

**Conversion of numeric average to Final (Letter) Grade:**
- 90 - 100 = A
- 80 - 89 = B
- 70 - 79 = C
- 60 - 69 = D
- 0 - 59 = F

**Attendance Policy**
Absence / Lateness - NOT ALLOWED
ARRANGE TO GET NOTES FROM ANOTHER STUDENT.
School is like a job. It is a commitment and absence or lateness will not be tolerated as it would not be tolerated in the workplace. If you miss or are late for classes you miss important material and you will fall behind. It is YOUR RESPONSIBILITY to make up any missed class work.

**Late Assignment Policy**
All homework, laboratories and reading assignments must be submitted on time. NO CREDIT FOR LATE WORK. If you do not do your homework, labs and reading, you will not be able to keep up with the class. I cannot slow down to pick up students who are not committed to making every class and doing all of the homework, labs and reading as assigned. I cannot check that you have done your reading but it will show up in your work and your ability to keep up with the class.

**Quizzes and Tests**
If you miss a test, it must be made up within 7 days of the original exam date. If you miss a quiz you will receive ZERO (0) points for that quiz, no makeup quizzes will be given. All Quizzes and Tests will be based on the Text, Lecture Material, Lab exercises and handouts.

**ACADEMIC HONESTY POLICY**
Students are required to maintain a high level of academic performance. Cheating and plagiarism are defined in Wor-Wic's Student Conduct Policy found in the College Catalog. Infractions of this policy will result in the student's failure for the assignment or test.