1. Course number and name

EML 3002L ME Tools Lab

2. Credits and contact hours

3 cr, 5 contact hours (50 min. lecture, 4 hrs. lab)

3. Instructor’s or course coordinator’s name

Instructor: Mr. Keith Larson, Coordinator: Dr. Patrick Hollis

4. Text book, title, author, and year

- Getting Started with MATLAB A Quick Introduction for Scientists and Engineers, Pratap, R., 2009
- Creo Parametric 2.0 Tutorial and Multimedia DVD, Toogood, R., and Zecher, J., 2013 (recommended)

5. Specific course information

a. brief description of the content of the course (catalog description)

This course covers communication and data handling, the engineering profession, ethics, introduction to the engineering design process, computer-aided design and drafting, programming concepts, and machine shop practice. Course includes building and testing a simple Stirling engine. Course is subject to an additional materials fee.

b. prerequisites or corequisites

Prerequisites: MAC 2311 Calculus with Analytic Geometry I; PHY 2048C General Physics A
Corequisite: EML3002 Mechanical Engineering Tools

c. indicate whether a required, elective, or selected elective course in the program

Required course

6. Specific goals for the course

a. Course Outcomes

At the conclusion of this course you should be able to:
1. Distinguish the difference between a profession and work [1]
2. Identify the role of engineers (and in specific mechanical engineers) in relation to societal needs [1]
3. Write a simple technical report, letter, memo, etc [3]
4. Use a spread sheet program (Excel) to analyze data [3]
5. Present the results of a research topic to an audience [3]
6. Use a mathematics program (MathCAD/MATLAB) to analyze data and perform simple calculations [4]
7. Use a CAD program (ProE) to produce engineering drawings, assembly drawings, and solid models of mechanical components and objects [5]
8. Operate basic shop equipment to build a Stirling engine [6]
9. Demonstrate and explain how a Stirling engine works [2, 3, 6]

Numbers refer to Course Objectives below, e.g. for course outcome 9, [2, 3, 6] refers to course objectives 2, 3, and 6.

b. Course Objectives and Relation to Student Outcomes

1. To understand the true meaning of a profession and the role of engineers in general and mechanical engineers in particular in meeting the everyday needs of the society [6, 8]
2. To introduce statics, dynamics, thermodynamics, mechanics, materials and their relationship to mechanical engineering [1]
3. Be able to create reports and present the results of your work [7, 8]
4. Be able to perform basic calculations and programming on the computer [10]
5. Be able to perform solid modeling on the computer [10]
6. Have a working knowledge of basic shop practices and be able to fabricate a working mechanical model [10]
Numbers refer to Departmental Student Outcomes, e.g. for course objective 3, [7, 8] refers to student outcome 7 and 8.

7. Brief list of topics to be covered
   • Engineering and mechanical engineering as a profession
   • Engineers and ethics, failures and real world
   • Design, and design tools
   • Introduction to design – introduction to the basic design process and professional practice
   • Technical communication skills – Microsoft Office
   • Student machine shop – Stirling engine build
   • Mathcad/MATLAB – problem solving and programming
   • Pro-engineer – GD & T, 3D modeling, engineering drawing