ENGR 126
ENGINEERING PROBLEM SOLVING
AND COMPUTER TOOLS

Course Outcomes

1. Develop a logical problem solving process which includes sequential structures, conditional structures and repetition structures for fundamental engineering problems. [A2, A3]
2. Translate a written problem statement into a mathematical model. [A3]
3. Solve fundamental engineering problems using computer tools. [A2, A3]
4. Perform basic file management tasks using an appropriate computer tool. [A3]
5. Work effectively and ethically as a member of a technical team. [B2, C3]
6. Develop a work ethic appropriate for the engineering profession. [C2]
7. Evaluate and provide feedback to improve solutions to engineering problems. [A7]
8. Reflect on personal and team performance to achieve continuous improvement. [B2]

Computer Tools and Skills
1. Matlab
2. Spreadsheets (Excel)

Fundamental Concepts
1. Design principles
2. Interpreting Data and Applying
3. Statistics
4. Programming structure

Engineering Skills – Non-computer related
1. Estimation
2. Graphical Representation of Data
3. Communication with team members

Laboratory Exercises
1. Communications (Internet, newsgroups, email)
2. Economic Analysis
3. Statistical Analysis
4. Simultaneous Equations
5. Unix Operating System
6. Programming Control Structures in Matlab
7. Curve Fitting
8. Functional Analysis
**COURSE NUMBER:** ENGR 126

**COURSE TITLE:** Engineering Problem Solving and Computer Tools

**REQUIRED COURSE OR ELECTIVE COURSE:** Required

**TEXTBOOK/REQUIRED MATERIAL:**

**COORDINATING FACULTY:** M. Ohland

**COURSE DESCRIPTION:** Introduction to the solving of open-ended engineering problems and the use of computer software including spreadsheets and MATLAB. Explicit model-development activities are utilized, and students are expected to develop skill at working in teams. This is emphasized both in laboratories and on projects.

**ASSESSMENTS TOOLS:** Surveys of baseline computer skills, efficacy, interest, and success predictors.

**PROFESSIONAL COMPONENT:**
1. Engineering Topics: Engineering Science – 1.5 credits (50%)
   Engineering Design – 1.5 credits (50%)

**NATURE OF DESIGN CONTENT:** lecture and learning exercises practicing various phases of a design process. In-class learning experiences, homework assignments, and exam problems will be modeled after a design process.

**COMPUTER USAGE:** Matlab, Excel

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**RELATED ME PROGRAM OUTCOMES:**
A2. Engineering fundamentals
A3. Analytical skills
A7. Integration of analytical, problem solving and design skills
B2. Teamwork
C2. Strong work ethic
C3. Ethically responsible in a global, social, intellectual, & technological context

**PREPARED BY:** M. Ohland

**TERMS OFFERED:** Fall and Spring

**PRE-REQUISITES:** MA 165 Analytic Geometry and Calculus I

**REVISION UPDATE:** June 8, 2007