

**Fall 2013  
Course Syllabus**

**Course Title: Introduction to Engineering Design (2 SH)**

ENGR 101 is a required course in the engineering major and satisfies the Information Technology competency requirement for the core curriculum.

**Instructors:**

<b>Section</b>	<b>Time</b>	<b>Instructor</b>	<b>Email</b>	<b>Office</b>	<b>Phone</b>
A	8:00 AM	R. Hoeksema	rhoeksem@calvin.edu	SB131	x6-6167
B	2:30 PM	R. Hoeksema	rhoeksem@calvin.edu	SB131	x6-6167
C	10:30 AM	G. Ermer	<a href="mailto:germer@calvin.edu">germer@calvin.edu</a>	SB141	x6-6302
D	12:30 PM	G. Ermer	<a href="mailto:germer@calvin.edu">germer@calvin.edu</a>	SB141	x6-6302
E	1:30 PM	R. Hoeksema	rhoeksem@calvin.edu	SB131	x6-6167
F	11:30 AM	D. Wunder	<a href="mailto:dbw4@calvin.edu">dbw4@calvin.edu</a>	SB130	x6-6337

**Required Textbook:**

*Studying Engineering: A Road Map to a Rewarding Career 4<sup>th</sup> Edition*, by Raymond B. Landis, Discovery Press, 2013.

**Grading:**

Introductory Design Project	10%
Service Design Project	30%
Quizzes and Homework	30%
Mentor Visit Report	5%
Class Participation	5%
Final Exam	20%

**Mentor Visit Requirement:**

During the course of the semester you are required to visit a practicing engineer in industry. You will choose the discipline of the mentor you wish to visit in September. You will then be placed into a group with several other students (one of whom will have access to a vehicle) and assigned a mentor. Contact information for your mentor will be available in October or early November. As soon as your mentor is assigned, your group will schedule a visit (typically for 1-2 hours) to the mentor's workplace, where you will be able to take a tour and ask questions. After completing the visit, you will submit a 1-page report describing your experience. All reports will be due the last day of class.

**Final Exam Schedule:**

Section A	Wednesday, Dec. 11	9:00 am
Section B	Thursday, Dec. 12	9:00 am
Section C	Monday, Dec. 16	9:00 am
Section D	Monday, Dec. 16	1:30 pm
Section E	Friday, Dec 13	9:00 am
Section F	Tuesday, Dec. 17	9:00 am

*Exceptions to this schedule will only be made in documented cases of emergency.*

## Course Expectations:

See Engineering Department “Guidelines for Professionalism”

## Academic Integrity:

*Because of the nature of the profession, honesty and integrity are expected of every engineer. With this, and especially in light of our common Christian commitment, instances of academic dishonesty will not be tolerated in this course. This course is intended to be a community of learners. As documented in the Calvin Engineering Academic Honesty and Integrity Policy (AHIP) (<http://www.calvin.edu/academic/engineering/ENGR-AHIP>), "engineering students at Calvin College are expected to learn and study with absolute integrity." The AHIP provides the framework for Engineering Department faculty to impose sanctions in response to dishonesty, within the guidelines of Calvin's Code of Student Conduct. Any questions, comments, and concerns regarding AHIP and its application in **this course** are welcomed.*

*Examples specific to ENGR 101:*

Course Component/Activity	Specific examples of academic dishonesty
In-class tests/quizzes	<ul style="list-style-type: none"><li>• Use of any unapproved resource material</li><li>• Obtaining answers from another student before or during the test/quiz</li><li>• Providing answers to another student before or during the test/quiz</li></ul>
Individually graded homework assignments	<ul style="list-style-type: none"><li>• Copying from another student or group effort</li></ul> <p><i>Although students may work together to explain concepts and answer questions, all computational work submitted must be generated by the individual student</i></p> <ul style="list-style-type: none"><li>• Copying a computer file from another student or group effort</li></ul> <p><i>Allowed: students working on separate computers, conferring occasionally when questions arise.</i></p> <p><i>Not allowed: students working on the same computer and typing information into a single file which is then submitted by separate students <b>or</b> students working on separate computers but typing into separate files exactly the same information which is then submitted by separate students.</i></p> <p><b><i>Each student file submitted should be distinctive to that particular student. All files submitted may be checked using software copy detection tools.</i></b></p> <ul style="list-style-type: none"><li>• Allowing another student to copy your work</li></ul>
Team design projects	<ul style="list-style-type: none"><li>• Fictionalizing data</li><li>• Using someone else's ideas without attribution</li><li>• Claiming contributions to team work on peer evaluations that you did not contribute</li></ul>
Reports/papers	<ul style="list-style-type: none"><li>• Plagiarism as defined in Calvin's English department policy</li></ul> <p><i><a href="http://www.calvin.edu/academic/engl/writing/plagiarism">http://www.calvin.edu/academic/engl/writing/plagiarism</a></i></p>

**Disabilities:**

Calvin will make reasonable accommodations for persons with documented disabilities. Students should notify the Coordinator of Services to Students with Disabilities located in Student Academic Services, HH455. Students should notify their instructors within the first two weeks of class.

**Course Learning Outcomes:**

In this course you will be introduced to the wide range of opportunities in the engineering profession and the characteristics of the field. You will also learn to use some of the methods and tools commonly used by engineers today as you work in groups on a service-learning design project.

- I. The Engineering Profession (looking outward and consulting outside resources)
  - a. The essence of engineering
    - i. Students can provide an articulate response to the question “What is engineering?”
    - ii. Students can describe ABET’s role in professional engineering education
  - b. Academic disciplines and job functions of engineering
    - i. Students can describe the major sub-disciplines of engineering and identify the differences between them (including listing the associated engineering societies)
    - ii. Students can list and describe a range of engineering job functions
  - c. Engineering in industry and academia
    - i. Students demonstrate awareness of the importance of internships
    - ii. Students will gain exposure to engineering practice through the mentoring program.
  - d. Motivation
    - i. Students will be able to articulate the rewards and opportunities as well as the challenges of engineering study and show they can serve God through the profession of engineering
- II. Engineering Performance (within the class structure – practicing what engineers do)
  - a. The design process
    - i. Students can state the advantages of following a structured design process and can list and describe the steps in a particular engineering design process
    - ii. Students can apply the engineering design process to an ill-defined and open-ended problem (service-learning project)
    - iii. Students can describe the design norms and apply them to their design activities (technology and values)
    - iv. Students can use some project management tools (agendas, minutes, design notebooks, scheduling)
  - b. Community building and teamwork
    - i. Each student in the class will know the first and last name of every other student in the class
    - ii. Students will interact with each other and project clients in a positive, professional, and effective manner
  - c. Entrepreneurship
    - i. Students will be able to describe the role of entrepreneurship and its relationship to engineering
    - ii. Students will be able to describe the different types of intellectual property
  - d. Tools
    - i. Students will be able to use spreadsheets for budgeting, engineering economics, graphing, and other computations
    - ii. Students will be able to find technical information using web searches, library databases and Calvin’s library resources

- iii. Students will demonstrate proficiency in delivering short technical presentations using PowerPoint
- iv. Students will demonstrate proficiency in writing technical documents (design report)
- e. Ethics and professionalism
  - i. Students will demonstrate awareness of good ethical and professional practices
  - ii. Students will be able to use a code of ethics and problem solving process to determine appropriate responses to potential ethical problems they might encounter in industry
  - iii. Students will demonstrate academic integrity at all times

### III. Engineering Academic Success

- a. Students will be able to articulate an understanding of Calvin's engineering degree, including the learning objectives and outcomes for the program
- b. Students will be introduced to the facilities, resources and regulations of Calvin's engineering department
- c. Active Learning
  - i. Students will be able to reflect on the importance of time management, course preparation, communal learning, and note taking
- d. Personal Development
  - i. Students will be able to describe their own learning styles as assessed using standard instruments
  - ii. Students can describe clear goals for their future, relate them to their faith perspective, and have a plan for achieving those goals based on a self-assessment of their strengths and weaknesses
  - iii. Students will prepare a professional resume

### Homework Policy:

All assigned work (whether in Moodle or on paper) will be due at the date and time specified by the professor. Any work handed in after the specified deadline (without prior notice and excuse) will be *worth half credit*.

### Important Dates:

- Friday, September 27, 2013 – Completion of Introductory Design Project
- Wednesday, December 4, 2013 and Friday, December 6, 2013 – Service Design Project Presentations
- Monday, December 9, 2013 – Service Design Project Reports due
- Monday, December 9, 2013 – Mentor Visit Reports due