Fall 2014
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:

Section	Time	Instructor	Email	Office	Phone
A	8:00 AM	J. Jewett VanAntwerp	jjvanant@calvin.edu	DH135	x6-8581
B	2:30 PM	A. Sykes	jas28@calvin.edu	EB135	x6-7188
C	10:30 AM	R. Plaisier	rgp3@calvin.edu	SB135	x6-7857
D	12:30 PM	G. Ermer	germer@calvin.edu	SB141	x6-6302
E	1:30 PM	R. Plaisier	rgp3@calvin.edu	SB135	x6-7857
F	11:30 AM	D. Wunder	dbw4@calvin.edu	SB130	x6-6337

Required Textbook:

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

Grading:

Introductory Design Project (Bottle Rocket)	10%
Service Design Project	30%
"World Class" Student Design Project	10%
Quizzes and Homework	20%
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. 10	9:00 am
Section B	Thursday, Dec. 11	9:00 am
Section C	Monday, Dec. 15	9:00 am
Section D	Monday, Dec. 15	1:30 pm
Section E	Friday, Dec 12	9:00 am
Section F	Tuesday, Dec. 16	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 or on-line tests/quizzes	• Use of any unapproved resource material while taking the test/quiz • Obtaining answers from another student before or during the test/quiz • Providing answers to another student before or during the test/quiz • Completing an on-line quiz for another student
Individually graded homework assignments	• Copying from another student • Allowing another student to copy your work • Copying written work or a computer file from a group effort *Allowed: students working on separate computers/papers, conferring occasionally when questions arise.* *Not allowed: students working on the same computer and typing information into a single file which is then printed and submitted by separate students* ***or*** *students working on separate computers/papers, but typing/writing into separate files/papers exactly the same information, which is then submitted by separate students.* ***Each student file submitted should be distinctive to that particular student. All files submitted may be checked using software copy detection tools****.*
Team design projects	• Fictionalizing data • Using someone else's ideas without attribution • Claiming contributions to team work on peer evaluations that you did not contribute
Reports/papers	• Plagiarism as defined in Calvin's English department policy *http://www.calvin.edu/academic/engl/writing/plagiarism*

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 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 permission) will be ***worth half credit***.

Important Dates:

- Friday, September 26, 2014 – Completion of Introductory Design Project
- Wednesday, December 3, 2014 and Friday, December 5, 2014 – Service Design Project Presentations
- Monday, December 8, 2014 – Service Design Project Reports due
- Monday, December 8, 2014 – Mentor Visit Reports due