ENGIN 1022: Survey of Engineering

Course Information

Jeff Bates, jeff.bates@utah.edu, WEB 1620, 801-581-8737

Section 001: Wednesday, 3:05 – 3:55, WEB L103
Section 002: Mondays, 11:50 -12:40, WEB L104

Required Textbook

Studying Engineering: 3rd (ISBN 0964696924) or 4th (ISBN 9780979348747) Edition, Raymond Landis

This course is designed to introduce students to each of the departments in the College of Engineering in addition to ways engineers solve problems through lectures and laboratory assignments. Students who take this course should have a solid understanding of each of the areas of engineering with regard to potential jobs, research in each area and the career outlook. It is designed to serve as a way for students to determine which field is the one they will choose to study.

Weekly Schedule:

Date	Course Topic	To Do Before Class	Homework Due
August 26	Introduction to the College of Engineering, Syllabus Overview, Discussion of Grand Engineering Challenges		
September 2	Discussion on Learning Styles Overview of Grand Challenges		Take the online quiz (pg. 119)
September 9	Introduction to Engineering Design Process (Based on FDA QSR Design Controls)	Read FDA Document Read Chapter 7	
September 16	Ambassador "Speed Dating"		3 questions to ask student ambassadors (will be turned in)
September 23	Grand Challenge: Providing Access to Clean Water	Read Chapter 3 www.civil.utah.edu	Discussion Assignment on Providing Access to Clean Water and Reflection Assignment: What did you learn from the Engineering Ambassadors?
September 30	Grand Challenge: Engineering Better Medicines	Read Chapter 4 www.bioen.utah.edu www.che.utah.edu	Discussion Assignment on Engineering Better Medicines and Reflection Assignment:

			What is the "need statement" for providing access to clean water?"
October 7	Grand Challenge: Preventing Nuclear Terror	www.ece.utah.edu www.cs.utah.edu www.nuclear.utah.edu	Discussion Assignment on Preventing Nuclear Terror and Reflection Assignment: What are the "design specifications" of engineering better medicines?
October 21	Grand Challenge: Engineering the Tools for Scientific Discovery	Read Chapter 6 www.mech.utah.edu www.mse.utah.edu	Discussion Assignment on Engineering the Tools for Scientific Discovery and Reflection Assignment: What are the "design specifications" of preventing nuclear terror?
October 28	Personality Quiz Discussion Engineering Project Description and Objectives	Read Chapter 8	Discussion Assignment on which Grand Challenge you would like to work on Reflection Assignment: What are the "prototype elements" and "verification test plan" of engineering tools for scientific discovery? Take the online quiz: *http://www.16personalities.com*
November 4	Assign Groups for the Project Hands-On Design Activity in Project Teams		
November 11	Lab Tours		Assignment: Outline of Proposal
November 18	Work on Projects During Class and Consulting Session		Assignment: 5 references of scholarly work that will be used in paper
November 25	Guest Lecture		
December 2	Engineering Project		Grand Challenge

	Presentations		Proposal Paper and Presentation Slides or Notes
December 9	Engineering Project Presentations		
December 16	Engineering Project Presentations		

Assignments (Discussion and Reflection)

During the period where we discuss the Grand Challenges, there will be a discussion and reflection assignment due each week (5 total). The first part will be called the discussion: please come prepared with 2 questions about the challenge and 2 things to share about the challenge; the second will be called the reflection, where you will answer the question listed for each week. These will be turned in either during class or by email no later than **5 pm on the day of class**. No late work will be accepted. These assignments can be a 1 page document, but you must include headings for each section.

Engineering Project Presentation and Proposal

For the engineering project, you will work with a team to propose a way you would solve one of the Grand Challenges of Engineering (www.engineeringchallenges.org). Please review the website and start thinking about the one you would like to work on. During the week of November 4, we will break into groups based on the challenges you want to work on. Please come to that class prepared to discuss your ideas with your group, so you can be prepared for the presentations during the weeks of December 2, 9 and 16. You will write a 5-7 page proposal and then create a presentation based on your proposal. Your presentation will last 7 – 10 minutes.

Proposal Outline

- **Introduction (1-2 page)**
  - Which grand challenge did you work on?
  - Summarize the challenge
  - Review of literature published in scholarly journals about current research topics aimed to address the grand challenge.
  - What is the needs statement?
  - What are the marketing requirements?
  - What are the design specifications?
- **Proposal (3-5 pages)**
  - What specific part of the challenge will you address?
  - How do you propose (as a team) addressing this challenge?
  - What are the prototype elements you have identified to meet the specifications?

    - Identify each team member, their major, and what aspect of the theoretical project they would work on and discuss how they would use the skills they gain in their chosen major to address their assigned portion of your proposed methods.
    - What verification tests will be performed to ensure your elements have met your requirements?
    - What do you hope will be the end result of your proposed work?
- **Future Research (1/2 page)**
    - What will be the impact (how will people benefit) of your work if it were successful?
- **Conclusions (1/2 page)**
    - What are the key, novel and innovative parts of your proposal?

Course Grading

Grading will be based on assignments and the final project.

- Participation: 10%
- Assignments: 40%
- Engineering Project Outline and References: 10%
- Final Project: 40%

Grade	Percentage
A	90-100%
B	80-90%
C	70-80%
D	60-70%
E	<59%