

Drexel University
School of Biomedical Engineering, Science and Health Systems
Junior Design Sequence

TITLE: Junior Design Seminar I
COURSE: BMES 381
CRN: TBD
TERM: Fall and Spring Quarters
CREDITS: 2
DATES: TBD
TIMES: One hour of lecture and 2 hours of recitation per week
PRE-REQ: Junior status in engineering

Course Description

This is a first course in a two-course sequence intended to present the basics of engineering design, project management, product development and translational research. This first course focuses on engineering design and product development. The course uses a case-study approach to investigate the do's and don't of engineering design.

Required Texts

Primary Text

Dym, C and Little, P. (2004). *Engineering Design: A Project Based Introduction, 2nd Edition*. John Wiley and Sons: New York (ISBN#0471256870).

Supplementary Texts

Dormer, D. (1996). *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations*. Perseus Books Group: Cambridge MA. (ISBN#0201479486).

Norman, D. (2002). *The Design of Everyday Things*. Perseus Books Group: Cambridge MA. (ISBN#0465067107).

Course Instruction

- *Lecture* – 50-minute lectures given each week cover specific aspects of engineering design and product development.
- *Recitation* – 110-minute recitations given each week will use case studies to elaborate on the lecture topics.

Assignment Policy

- *Readings Assignments*– Selected reading assignments will be given on a weekly basis. The primary and secondary textbooks along with articles gathered from the Web will be the source of assigned readings. However, students are encouraged to cross-reference topics in supplemental references.
- *Homework* – Homework problems will be periodically assigned. Assignments are to be completed on an individual basis unless otherwise indicated.

- *Participation* – Students are expected to attend class regularly, to actively participate in class discussions and to contribute effectively to work group activities.
- *ePortfolio* – Students will create an electronic portfolio of materials learned during the course. This portfolio will serve as a preliminary personal manual for Senior Design.
- *Project* – Students working in teams of 4-5 will be required to submit a preliminary engineering design proposal.

Grading

Homework	25%
Participation	25%
ePortfolio	25%
Final Project	25%

Topic Schedule

<u>Week</u>	<u>Topic</u>	<u>Reading</u>
I.	Basic Engineering Design	
1	What is engineering design?	Dym&Little, Chpt. 1
2	The design process	Dym&Little, Chpt. 2
3	Working for a client	Dym&Little, Chpt. 3
4	Functions and specifications	Dym&Little, Chpt. 4
5	Problem solving	Dym&Little, Chpt. 5
II.	Design and Human Factors	
6	Problems in Design – Examples	Dorner, Chpt. 1 Norman, Chpt. 1
7	Engineering demands and human psychology	Dorner, Chpt. 2 Norman, Chpt. 2
8	The nature of knowledge	Dorner, Chpts 3,4 Norman, Chpts. 3,4
9	The nature of knowledge (continued)	Dorner, Chpts. 5,6 Norman, Chpts. 5,6
10	User-centered design	Dorner, Chpt. 7 Norman, Chpt. 7