ME360: Product Design, Fall 2015

Instructors:

Dr. Enrique Gutierrez-Wing, esgw@bu.edu, (617) 358-1137, EMA 202c
Office hours: by appointment

Prof. Greg Blonder, gblonder@bu.edu

Class Times:	Tue,Thu 10:00-12:00
Class Location:	EPIC Design Studio, 750 Commonwealth Avenue
Prototype testing:	EMA 215, 730 Commonwealh Avenue (above CVS)
TA & Contact Info:	David Miller, dsmiller@bu.edu
Prerequisites:	ME359 - Introduction to CAD and Machine Components, or ME407 - Computer Aided Design and Manufacture.

CourseWebsite: http://learn.bu.edu

Course Description

In this project-based course you will develop skills to convert your ideas into engineering products. The activities are organized around the concept of a start-up and are aimed at giving you firsthand experience in forming your own company and developing your flagship product from concept to prototype.

The course emphasizes the use of technical and analytical skills for product design. Lectures and discussions will provide you with the elements to meet the challenges encountered at each design stage. CAE Tutorials are used to simulate the physical behavior of engineering systems to support your decisions and to improve your designs.

The course will culminate in a public event in which teams will pitch their ideas and demonstrate their products to members of the academic and local startup communities. The event will be open to the public and will take place during the last week of the course.

Learning Objectives

By the completion of this course, the student will:

- Analyze an adverse practical scenario and identify the problem(s) causing it.
- Identify the stages of a product design process: observation and problem definition, preliminary design, engineering analysis, detailed design, prototyping and testing.
- Work as part of a team through a structured design process.

- Apply engineering principles to guide her/his design decisions with respect to: statics, kinematics, dynamics and heat transfer issues, material selection, manufacturing processes and product usability.
- Build and test prototypes to assess the appropriateness of a proposed design.
- Interpret test data and use it to validate, improve or discard a proposed design.
- Communicate with a technical audience or a potential customer at the different stages of the design process through: design briefs, project proposals, sketches, engineering drawings, technical reports and group presentations.

Textbook

The Materials Selection sessions will be based on the following book, which can be accessed free of charge through the BU e-brary:

Materials Selection in Mechanical Design
Author: Ashby, Michael
Publisher: Butterworth-Heinemann
Date Published: 01/2005

Reading materials and videos will be provided through the course Blackboard portal.

Grading

1) Class activities and attendance [30%] includes CAE tutorials, design exercises, product presentations and quizzes.
2) Assignments [30%] based on homework, assigned reading materials, course sketchbook and practical tasks outside the classroom.

   This include some or all of the elements below:
   - Perform initial customer research, gather requirements, conceptual design.
   - Refine requirements, translate to functional, sketch concept ideas and formalize process communication.
   - CAD, tolerance analysis, physics, modeling, FEA.
   - Refine design, produce measured 2D drawings, bill of materials.
   - Create and test prototypes and models.
   - Incorporate feedback into design, develop manufacturing plan (processes, materials, costs, product success testing.)
   - Final report with analysis, test results and presentation.
3) Team Design Project [40%] will consist of developing the prototype of a product, project report and oral presentation.

Rules

1) No food or drink (except water) in the EPIC studio.
2) No use of phones or laptops in class.