Boston University
College of Engineering

Course Syllabus –Fall 2010

ME 415 Product Design

1.0 Course Description

This course emphasizes the profitable conversion of product ideas to attractive products needed by customers. The course consists of a series of design projects, of increasing complexity, culminating in the development of an operations plan for product manufacture and delivery. Exercises include both product design and product manufacturing considerations. Extensive use is made of both SolidWorks and COSMOSWorks software. Resources for the design exercises are presented in working studio sessions.

Prerequisites: ME 345 Automated Manufacturing, EK 409 Engineering Economy, and EK 409 Computer-aided Design and Manufacture. Please talk to the instructor about exceptions.

2.0 Course Outcomes

As an outcome of completing this course, a student will:

1. Gain an increased understanding of production and service operations in manufacturing companies.
2. Develop an increased facility for using major CAD systems to do engineering design.
3. Learn about the creative end of product design and development, and about the other key ends of the business that are required to turn a creative idea into a real commercial product.
4. Gain experience with product and process design for sheet metal, castings and plastic parts.
5. Develop experience with business ideation, demand confirmation and resource specification for manufactured products.
6. Gain experience in creating an operations plan for a manufactured product that is balanced in specification of product and process.
7. Gain experience and confidence in working in a team environment.
8. Gain a facility for producing well-organized and clearly written engineering reports.

3.0 Assignments and quizzes

Below is the tentative list of possible topics as of 9/2/2010. The topics may change somewhat as we get deeper into discussions this semester, but plenty of notice will be given. The net is that there will be six assignments, with each one typically due within two weeks.

In addition there will be two quizzes, each equal to half an assignment, plus a sketch notebook, equal to one assignment. The six assignments, plus two quizzes (equal in sum to one assignment), plus notebooks, make up eight equally weighted graded items for the course. The final grade is based on these eight tasks. Below are the six assignments.

1. Web-based review of a manufacturing company
2. Development of a product plan for a selected product
3. Product failure analysis
4. Rapid prototyping (weighted 1.5)
5. Manufacturing process presentation (weighted 0.5)
6. Design of innovative new product, plus market analysis.

The other two parts consist of the two quizzes, plus an ongoing assignment throughout the semester of maintaining a notebook to help focus on design and redesign issues. In particular, students should maintain sketches of good/bad designs, with appropriate explanations, plus assignments in class.

Regarding the two quizzes, they will be based on (1) lectures, (2) readings from our book, and (3) presentations on products that I will be asking each student to make during the semester. If you miss class, then clearly (1) and (3) will be hard to make up. Consequently, if you miss a lecture, you are responsible for discussing/obtaining the information with a colleague in class. Some lecture material will be posted at our website, but much will occur via discussion, requiring you to take notes.

The quizzes will be given roughly at the midway point and near end of the semester, and will be my attempt at ensuring you read the assigned material, and attend lectures. I will strive to make the lectures relevant for your assignments, and to provide information helpful to your future careers.

Regarding product presentations, which I will explain in more detail in class, please bring in something that you find interesting and exciting. Besides describing the obvious novelty of the product, please be prepared to add your thoughts on (1) the virtues of the product (usually the easy part!), (2) where the product could still be improved, and (3) your views on the costs and manufacturability aspects of the product. I am not looking for something in great depth here, but, come in having given at least these points some thought.

4.0 Textbooks

There is only one book required, which is a custome one combined by McGraw Hill. This book has isbn #9780390279743. It combines all of the book by Ulrich and Eppinger book below, with part of the book below by Deiter and Schmidt. Fortunately, the net result is the combined book is actually cheaper than either book separately!

Ulrich, K. and Eppinger, S. "Product Design and Development" (4th Ed.), McGraw-Hill 2007 (ISBN-10: 0-07-310142-7, ISBN-13: 978-0-07-310142-2).

Deiter, G. and Schmidt, L., "Engineering Design," McGraw-Hill 2008
(ISBN-13: 978-0072837032).

This book you may find helpful and interesting, but it is not required:

Haller, L. and Cullen, C. D., "Design Secrets: Products 2," Rockport Publishers, Inc., 2004.

Not required, but an excellent text that you might consider for your library: Jensen, C. , Helsel, J. D. and Short, D. R., "Engineering Drawing and Design" (7th Edition), McGraw-Hill, 2008 (ISBN 978-0-07-352151-0)

5.0 Grading

Grades for this course will be computed as follows. On each assignment (six of them), on the notebook, and on the two quizzes, you will receive a number grade. I will average the two quiz grades to get one grade. This will result in eight grades: six for the assignments, one for the two quizzes, and one for the notebook. These will then be averaged together to give one final course grade. This grade will then be converted into a "letter" course grade in the following way: 80=>83.33 would be a B-, 83.34=>86.66 would be a B, and 86.67=>89.99 would be a B+, and likewise for the other ranges of 70=>79.99, 90=>99.99, etc.

6. Course Web Site and Web Links

ME 415 will shortly be available on course info, at

http://blackboard.bu.edu

I expect to be sending you emails regularly from this course info site, so make sure you are using your @bu.edu email accounts. I will also post information regularly at this site.

The following Internet sites, provided as links on the course web site, may well be referred to at various points in this course:

Concord Camera	**Fraunhofer CMI**	**3M**	**Cole's Research Site**
Corning	**Husky Molding Systems**	**Lean Institute**	**SME:mic.com**
Design Continuum	**Kohl's**	**Nypro Plastics**	**Ulrich & Eppinger**
DME	**Kurt Manufacturing**	**Plast. Tech. Mag**	**U.S. Patent Office**

Our course web site will soon have links to these internet sites.

7. 0 Contacts

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dcc: 9/3/2010