

IEEM 3200 Product Design and Development

Spring 2008

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Class Time: Tu 2:10PM – 5:00PM

Class Room: First Engineering Building, Room 704

Course Website: E-learning Website

TA: 蔡瑋倫, 42937, Room 714,

Textbook: *Product Design and Development*, K.T. Ulrich and S.D. Eppinger, McGraw Hill, 3rd Edition, 2004.

References:

1. Class-notes and related reading materials.
2. *Product Design*, K. Otto and K. Wood, 2000, Prentice Hall.

Course Description:

This course introduces students the basic concept, process, methodologies, management practices, and information technologies in new product development (NPD). The goal is to equip IE students with fundamental knowledge in product design and realize its interdisciplinary nature.

In order to achieve this goal, students in group must realize one product idea for improving elder people, i.e. 福祉設計, in a NPD project. This project is to provide a real environment where students can experience and learn new product development in a distributed manner at school. Each group is responsible for the *marketing, product planning, product specifications, product architecture, concept generation, engineering design* tasks, in addition to *project management, scheduling control, cost management, project coordination*, as well as *liaison*. Several rules are imposed on the project execution:

1. Important communication, discussion, and negotiation have to be accomplished via electronic medium like MSN, email, and other tools. Note that this project is to

mimic actual engineering collaborations among people geographically dispersed, prevailing in current Taiwan industry.

2. The project execution and the final grading emphasize the process, not the final result.
3. The execution details in the project and the output at each stage must be recorded and well documented. In addition, all the discussion note, decision factors, and related documents among team members should be preserved and will be graded.

Project Scope

Each project consists of four team members: Project Manager (PM), Marketing Staff, Design Engineer, and Manufacturing Engineer (Purchasing Staff). One of them will be a graduate student from 長庚工設. Note that the boundary and tasks of each role is not well-defined (this is the nature in the real world). Many activities must be conducted by team, not individually. Each group needs to conceive a product concept for 福祉設計, generate two sketches, and realize one design during the course of the project subject to functional, schedule, and budgetary constraints. In other words, students need to manage the project by controlling quality, scheduling, and cost.

1. Functional
 - As simple as possible (things are more complicated than you think, believe me!)
 - In most cases, the product will be an assembly. It must contain at least one mechanical part, one electrical component, and one standardized part that can be purchased. In addition, one mechanical part must be custom-made.
 - The working prototype must demonstrate one mechanical assembly (e.g. screw, pin/hole, snap fit, glue, ... etc), one electrical function (light bulb, LED, sensor, logic operator, ... etc), and the original design function.
 - In a very rare case, the product can be software or service system.
2. Schedule: details TBD
3. Budget: 5000 NT\$ including the costs of raw material for the customized part and all the purchased parts, but without labor and overhead.

Success of modern NPD heavily relies on proper software/hardware tools. Therefore, this course aims at providing a learning environment for students to get familiar with these

technologies, with focuses on PDM (Product Data Management, for project, document, and workflow management), CAD (for product design), and other Internet collaboration tools (online meeting, email, 3D viewing). Although students are not expected to become expert in the software systems, they should be able to finish all the course work with them. Basic training sessions will be arranged. However, most of the time students must learn by themselves and by doing.

In addition, a working prototype must be accomplished for each product idea. We will have a tradeshow in the end of the semester. Each group will make a poster and demonstrate the prototype for public in this event.

This course is not a typical engineering course conducted only via lectures and homework. We emphasize less on theories, but more on handons and learning of real-world experiences. Students are expected to spend a significant amount of time on the course activities. The grading will be determined by the process of the project running and team dynamics, rather than the final result!

Grading:	Homework	20%
	Class Participation	10%
	Midterm	20%
	Final Project	50%

Schedules (tentative):

Date	Topic
Week 1	Course introduction
Week 2	Product development & planning
Week 3	<i>PDM training</i>
Week 4	Identifying customer needs, 長庚 field study
Week 5	Product specifications
Week 6	Concept generation
Week 7	<i>CAD training</i>
Week 8	Product architecture (I)
Week 9	Product architecture (II)
Week 10	<i>Midterm</i>
Week 11	Engineering design
Week 12	Industrial design
Week 13	Design for X
Week 14	Prototyping
Week 15	Product evaluation technologies
Week 16	Collaborative design
Final week	<i>Tradeshow</i>