

IEEM 3200 Product Design and Development

Instructor: Professor Chih-Hsing Chu (瞿志行)
First Engineering Building, Room 823, 5742698

Class Time: Monday 15:30-17:10, Thursday 14:20-15:10

Course Website: TBA

TA: 吳旻駿 Room 723, 33931

Textbook: Product Design and Development, K.T. Ulrich and S.D. Eppinger, McGraw Hill, 4th Edition.

References:

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

Course Description:

This course introduces the basic concept, process, methodologies, management practices, and information technologies in new product development (NPD). Students are expected to learn fundamental knowledge in product design, to realize its interdisciplinary nature, and to position themselves in product value chain for future career.

In order to achieve this goal, students in group must realize one product concept. This project is to provide a real environment where students can experience and learn new product development in a school environment. Each group is responsible for marketing, product planning, product specifications, product architecture, concept generation, engineering design, prototyping, in addition to project management, scheduling control, cost management, project coordination, as well as liaison.

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

Project Scope

Each project team consists of 4 team members: Project Manager (PM), Marketing Specialist, Industrial Designer (TBA), Design Engineer, and Manufacturing Engineer. Note that the boundary and tasks of each role is not well-defined (this is the nature in real industry). Many activities must be conducted by team, not individually. Each group needs to conceive a product concept, 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, time, scheduling, and cost.

Functional

1. As simple as possible (things are more complicated than you think)
2. In most cases, the product will be an assembly. It must contain at least two mechanical parts, one electrical component, and one standardized part that can be purchased. In addition, one mechanical part must be custom-made.

3. 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.
4. The product can be software or service system.

Schedule: details TBD

Budget: 3000 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 management, 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 these software systems, they are expected to finish all the course work using these tools as much as they can. 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. Interdisciplinary design is the idea we want to convey through this class. 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/Team Participation 5%
Midterm 35% Final Project 40%