IEEM 3200 Product Design and Development Spring 2022

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

Class Time: Thursday 9:00-12:00

Course Website: TBA

TA: TBA Room 727, 33931

Textbook: Product Design and Development, K.T. Ulrich and S.D. Eppinger, McGraw Hill, 7th 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 their 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 school environment. Each group is responsible for marketing analysis, 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 produced at each stage must be recorded and well documented. All the discussion notes, decision factors, and related documents among team members should be preserved and will be graded.

Project Description:

Each project team consists of 6 students and each student plays one following role: Project Manager (PM), Marketing Specialist, Industrial Designer and Visualization Specialist, Hardware Engineer, and Software Engineer. Note that the boundary and tasks of each role is not clearly 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 several 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 properly controlling quality, time, scheduling, and cost.

Students will practice technology driven innovation in new product development. The enabling technology we choose for this semester is “Augmented Reality (AR)”. In this case, a typical product must solve people’s pain point and/or problem by both software and hardware functionality. A working prototype must be accomplished for each product idea. We will have a tradeshow at the end of the semester. Each group will make a poster and display the prototype for public in this event. The final prototype must demonstrate the original design functions and comply with the product specifications each team propose.

Each team has a budget of 2000~3000 NTD including the manufacturing costs and purchase for all mechanical and electrical parts, but without labor and overhead.

We will arrange several design workshop and software training sessions on Saturdays. The timeline will be announced in advance and all students must attend those weekend events.

This course is not a typical engineering course conducted only via lectures and homework. We emphasize less on theories, but more on handons, exposure, and learning of real-world experiences. Interdisciplinary design is the idea we want to convey throughout 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% + Midterm 35% + Final Prototype/Tradeshow 40% + Class/Team Participation 5%

week	activity
1	Introduction
2	Product Development Process
3	Product Planning (I)
4	Product Planning (II)
5	Customer Needs Analysis
6	Brainstorming Workshop
7	Product Specifications
8	User Experience Design
9	Product Data Management
10	Product Architecture (I)
11	Product Architecture (II)
12	Product Architecture Implications
13	Industrial Design
14	Final Exam
15	Prototyping Workshop
16	Final Presentation