

1. Course number and name

EE 415: Design Project Management

2. Credits and contact hours

3.0 (one lecture hour per week plus 6 lab hours per week)

3. Instructor's or course coordinator's name

Patrick Pedrow

4. Text book, title, author, and year

Karl T. Ulrich and Steven D. Eppinger. 2016. *Product Design and Development* (6th ed.). McGraw Hill Education.

5. Specific course information

- a. *Catalog description:* Project scheduling/planning, technical writing, oral presentation skills, working in teams, total quality control (TQC), total quality management (TQM), and market-driven organizations.
- b. *Prerequisites or co-requisites:* EE 341 with a C or better and EE 361 with a C or better; or EE 334 with a C or better and CPT S 360 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering.

6. Specific goals for the course

At the end of this course, students must be able to:

- Clarify a design problem. (1, 2, 4, 7)
- Identify stakeholders. (2, 4, 6)
- Identify client needs. (2, 4, 6)
- Map client needs to target technical specifications. (1, 2, 4, 6)
- Conduct impact analysis with techniques such as use case scenarios, fault trees and design for environment algorithms. (1, 2, 4, 7)
- Decompose a system into a set of subsystems or a sequence of events. (1, 2)
- Generate design concepts that meet target technical specifications. (2, 7)
- Apply decision matrices to select the optimal design concept from a matrix of design concepts. (1, 2, 4, 6)
- Demonstrate competency with teaming skills. (2, 3, 4, 5)
- Design, model, construct, test, and demonstrate a prototype that satisfies client and stakeholder needs. (1, 2, 4, 6, 7)
- Communicate in written, oral and graphical formats. (1, 2, 3, 4)

7. Brief list of topics to be covered

- Teaming activities including selecting communications liaison, responding to breakout session prompts, interacting with industry mentor, and engaging in the iterative design process,
- Problem clarification activities including interviewing the team's client, identifying project stakeholders, locating raw data, and determining needs that must be satisfied by the design,

- Engineering professional skills activities including impact analysis using tools such as use case scenarios, fault trees, and design for environment,
- Work with technical specifications including identifying metrics and values that map to client and stakeholder needs,
- Concept generation activities including system decomposition into subsystems or into a sequence of events followed by generation of concept combination tables, literature searches, patent searches, benchmarking, and brainstorming,
- Concept selection activities including the use of scoring matrices,
- Communication activities including presenting an alpha prototype demonstration to an audience and a written report on that event,
- Students modify their design based on alpha prototype outcomes,
- Students engage in online chat stream discussions that are archived and capture the team's design process,
- Teams write and circulate monthly reports to faculty and industry volunteers.