Mech 491 Mechanical Engineering Design

Objectives

Mechanical engineering design is the process of devising a system, component, or process to meet desired needs. It is a decision making process (often iterative), in which the basic sciences, mathematics, and engineering principles are applied to convert resources optimally to meet a stated objective. Among the fundamental elements of the design process are the establishment objectives and criteria, synthesis, analysis, construction, testing and evaluation.1

Mech 491 is a unique design activity within the ME curriculum. It is a capstone design course meant to demonstrate knowledge and skills attained during your academic career by completing a design project.

All the projects provide the opportunity to incorporate concepts learned throughout the ME curriculum. Projects also provide an opportunity to organize, manage and complete a product development project in its entirety.

Objectives

1. Follow a process for designing a system.
2. Design a system to meet defined functional requirements.
3. Build a working prototype of a designed system.
4. Write a formal technical document that describes a system, its operation and its construction.
5. Practice group dynamics and team building.
6. Follow a project plan for completing and managing a project.
7. Operate test equipment and/or design tools for the design, test and troubleshooting of a system.
8. Demonstrate the functionality and operation of a system for a general audience.

Tentative Schedule

- **Week 1**: Engineering design academic coordinator will meet with all senior Mechanical Engineering students in first week of the fall/spring semester. (Meeting time/place will be announced.)
- **Week 1**: Potential project ideas will be posted on the course website. (Check out http://home.ku.edu.tr/~mmuratoglu/ME491/index.htm)
- **Week 1**: The students will form project groups by the second class of the fall/spring semester.
- **Week 2-3**: Each group of students will submit the Mech 491 Engineering Design Project Proposal to the academic coordinator and project advisor by the third class of the fall/spring semester. (Proposal template is available on the course website.)
- **Week 7**: Mid-term Presentation: Each team will present their progress on the project. Each presentation will be 15 min. and the schedule, time and place will be posted later.
- **Week 14**: At the end of the semester, students will present their work in the form of posters at the Engineering Design Day. The best poster award will be given to the best demonstration. Each team will also make a final presentation at Mechanical Engineering Design Project Workshop day.
- **Final Week**: After a successful poster and oral presentations, each project group will submit a final Engineering Design Project Report to the faculty advisor and academic coordinator by the last day of final exams of the fall/spring semester.

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1 Adopted from “ABET” definition of “Engineering Design”.

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Grading Policy

- Proposal and presentation 20%
- Project demonstration (poster + demo) 50%
- Final report 30%

Project Proposal

Each project will have a project plan outlining the major tasks of the project and will be submitted electronically to the shared folder by the third class of the fall/spring semester. A template for the proposal is available at the course webpage.

Mid-Term Presentation

Each team will make a short presentation (10-15 mins.) about their progress and the current status of the project towards the mid-semester. All team members must be present at the presentation. Meeting date/schedule will be announced later.

Purchasing Parts and Materials

In many cases, parts and other materials will be needed for the projects. It is expected that the students will purchase the necessary items.

There are three ways to obtain the parts you need:
1. Purchase them locally (e.g. Selanik Pasaji, Karaköy Pasaji-Karaköy, Perpa)
2. Order them directly from supplier
3. Get them directly from the manufacturers as samples.
4. Ask our technician Muzaffer Butun.

“Free” parts may be acquired by obtaining “samples” from manufacturers and distributors. This source can often be tapped by calling the manufacturer and identifying yourself as a KU student and explaining what your project is and how their part would be applied.

Machine Shop:

The machine shop (http://eng.ku.edu.tr/machine) is located in ENG -212. It provides service to engineering students and faculty. Several power-driven tools are available in the shop for making, finishing, or repairing machines or machine parts. You can work in the machine shop under the supervision of Muzaffer Butun (technician).

Academic Regulations and Academic Integrity

Academic dishonesty in the form of cheating, plagiarism, or collusion are serious offenses and are not tolerated at Koç University. University Academic Regulations and the Regulations for Student Disciplinary Matters clearly define the policy and the disciplinary action to be taken in case of academic dishonesty. Failure in academic integrity may lead to suspension and expulsion from the University. Cheating includes, but is not limited to, copying from a classmate or providing answers or information, either written or oral, to others. Plagiarism is borrowing or using someone else’s writing or ideas without giving written acknowledgment to the author. This includes copying from a fellow student’s paper or from a text (whether printed or electronic) without properly citing the source. Collusion is getting unauthorized help from another person or having someone else write a paper or assignment.