# Experiences in Teaching Sophomore Design in Mechanical Engineering

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## Abstract

The author has (and continues) to teach, each semester, a required, project oriented, introduction to design course at the sophomore level since 1991 (a total of 26 times). While the course content has changed very little in the past ten years (engineering in the global prospective, the design process, shop practice, introduction to manufacturing, engineering communications, specifications, personality and group issues, codes and standards, intellectual property, engineering ethics, and introduction to engineering economy), the projects have changed every semester. Each semester there is major, semester long, team project that requires the design, fabrication and testing of a device to satisfy a set of constraints and attempts to reach a set of performance standards and structural goals. The students in groups of four are required to submit documents (two progress reports and final report), make a final oral presentation, submit their device for two testing events (one early in the semester and one late in the semester with different constraints and goals), and submit their device for final evaluation. This team activity counts for about half the course grade. Each student completes a peer evaluation of his/her teammates and the individual grade for the team project may be raised or lowered based on this feedback. Students also complete one or two individual projects during the semester and take a final exam.

The paper will relate some of the lessons learned over the years that are directly applicable to teaching design at this level. Some the interesting activities that will be described include:

- interactions with a fundamentals course in the visual arts in which teams of engineering and art students worked on small projects together and in one case worked on the course's major design project together for a limited time.
- Interactions with similar design class at the Kanazawa Institute of Technology in Japan while working on the same small design project that had culture influences.
- Interactions with the senior level design course in which the sophomore class acted as the client

The major project is different each semester and its format and "structure" have evolved over the years. However, the objectives, format and expectations have finally reached a steady state. Based on these experiences a "formula for success" for sophomore design projects has been developed and will be presented in the paper.

Over the years several papers have been written on the experiences in the course and these papers will serve as a resource for this paper.

## References


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