Course Information

Catalog Description: The senior design project, which was begun in MENG 4115, continues to completion. This major capstone design project builds on previous course work, includes all stages of the design process, and takes into account a variety of realistic constraints, such as manufacturability and sustainability; economic factors; and environmental, safety, and reliability issues. Preparation and presentation of final oral and written reports are required. The design project may be a team effort and may be defined in conjunction with industry.

Prerequisites: MENG 4115

Required, Elective, Selected: Required

Course Goals

Instructional Outcomes: By the end of this course students will be able to:

1. Produce a design solution meeting design specifications, appropriate codes and standards, and multiple realistic constraints.
2. Use engineering techniques, skills, and tools including computers to identify and solve design-related problems.
3. Evaluate alternative design solutions using various socio-economic measures, e.g., business practice, economic, and quality of life.
4. Apply relevant aspects of professional codes of ethics when considering possible alternative decisions.
5. Generate an artifact of the design that may be a functioning prototype or a significant module of the prototype.
6. Devise and conduct tests to evaluate the performance of the artifact or prototype(s).
7. Analyze and report the results of performance testing of the artifact or prototype(s).
8. As a team member, plan, prepare and deliver well-organized, logical oral presentations.
9. As a team member, produce the project final design report using appropriate format, grammar, mechanics, and professional graphics.
10. Write periodic progress reports of their individual contributions to the design team activity.
11. Collect, analyze, and evaluate new information from external sources

Relationship to Student Outcomes: This course supports the following Mechanical Engineering Program Student Outcomes, which state that our students will:
1. be able to apply science, mathematics, and modern engineering tools and techniques to identify, formulate, and solve engineering problems
2. be able to design thermal/fluid, mechanical, and electro-mechanical components or systems, individually or on interdisciplinary teams, and effectively communicate those designs in both technical and non-technical forums
3. be able to collect, analyze, and interpret data from prescribed and self-designed experimental procedures and formally communicate the results
4. be able to apply a broad-based educational experience to understand the interaction of engineering solutions with contemporary business, economic, and social issues
5. recognize that ethical behavior and continuous acquisition of knowledge are fundamental attributes of successful mechanical engineering professionals

Topics Covered
- Working to Specifications
- Assessing Needed Computation
- Executing Computation and Quality Assurance Checking
- Obtaining and/or Executing Fabrication and assembly
- Prototype Testing and/or Demonstration
- Reports
- Presentations

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