

MECHANICAL ENGINEERING PROGRAM

ABET COURSE SYLLABUS

ME 497 - Senior Design Project I (2 credit): Required Course

Course Description (2008-2010 Catalog): Synthesis course to involve students in the design process. Project proposal and design definition.

Prerequisite Course: Corequisites Senior standing in engineering

Textbook: Product Design and Development, 4th edition, K.T. Ulrich and S.D. Eppinger, MCGraw-Hill (suggested);

Other Reference Material: Innovation on Demand, New Product Development Using Triz, V. Fey and E. Rivin, Cambridge (suggested);

Course Coordinator: Z.Y. Wang, Associate Professor

Course learning outcomes:

- 1) The general scope and feasibility of the design should be accomplished, and the design is to be completed with full documentation during the second semester.
- 2) This design experience should involve elements defined by the Accreditation Board for Engineering and Technology (ABET).
- 3) To receive a passing grade in the class, each student will have to demonstrate that the design has met objectives by considering various alternatives and meeting predefined constraints;
- 4) Understanding the impact of engineering solutions in a global and societal context and professional and ethical responsibility.
- 5) Multi-disciplinary projects and producing prototypes are strongly encouraged.

Relationship of Course to Mechanical Engineering Program Educational Outcomes:

Goal 1: Provide mechanical engineering graduates with technical capabilities.					Goal 2: Prepare the mechanical engineering graduates to have effective workplace skills.				Goal 3: Instilling a sense of responsibility as a professional member of society.			
1.a	1.b	1.c	1.d	1.e	2.a	2.b	2.c	2.d	3.a	3.b	3.c	3.d
H	H	H	H	H	H	M	M	H	M	M	M	L

(L)ow (M)edium (H)igh

Topics Covered:

- 1) Recognition of the needs (Who are the real customers? Who will buy the product? Is it profitable to develop the product? Is it feasible to develop the product?)
- 2) Definition of the problem (problem statement, what this design is intended to accomplish – customers’ requirements and design specifications, clearly outline the overall function that needs to be accomplished and provide sub-function descriptions);
- 3) Gathering of information (history of the problem, any similar designs?)
- 4) Design conceptualization (decompose your designs (3-5) into subsystems; start drawings - sketch)
- 5) Evaluate 3-5 conceptual designs and choose the best design by feasibility, technology readiness, and decision matrix that includes technical requirements, costs, easy to produce, and product safety and liability, etc.
- 6) Decompose design into components; Perform stress/strain/deformation analyses on the components of your design.
- 7) Modify design based upon performance, cost, design for manufacture, and design for assembly.
- 8) Produce layout drawings, assembly drawings, and some detailed drawings with dimensions and tolerances.

Laboratory Projects: N/A

Class/Laboratory Schedule: N/A

Assessment of Student Progress toward Course Objectives

Two monthly presentations, ten monthly briefings, and final presentation and final report

Class/Laboratory Schedule: MW 2:30-3:20 PM (Spring Semester)

Contribution of Course for meeting Professional Component:

- | | |
|------------------------------------------|-----------|
| (a) Mathematics and basic sciences: | 0 credit |
| (b) Engineering Topics (Design/Science): | 2 credit |
| (c) General Education: | 0 credit |
| (d) Others: | 0 credits |

Prepared By:

Z.Y. Wang

Date:

10/22/2009