Course alpha, number, title: ME 481 Mechanical Engineering Design Projects

Required or elective: Required


Prerequisite(s): (ME 410 and ME 471) and completion of Tier I Writing requirement

Textbook(s) and/or other required material: Thompson, Creative Engineering Design, Okemos
ME 481 course web site: http://www.egr.msu.edu/classes/me481/course/

Class/Lab schedule: Total Credits: 3 Lecture/Laboratory/Discussion Hours: 1/4/2

Topics covered:
- a. Design Process
- b. Problem Definition
- c. Modeling and Analysis
- d. Design Optimization
- e. Project Management
- f. Safety
- g. Engineering Economics
- h. Intellectual Property Issues
- i. Green Engineering
- j. Technical Communication
- k. Engineering Ethics
- l. Creativity

Course learning objectives:
Given a real world design projects students will be able to:
(a) define the problem
(b) specify function and develop constraints
(c) behave professionally with a client
(d) present written and oral progress reports
(e) create numerous potential solutions
(f) evaluate these solutions
(g) select the solution with the highest potential for success
(h) analyze this solution
(i) develop plans for creating/acquiring the parts
(j) manufacture and test the prototype
(k) write the final report and present the final oral and poster presentations
Relationship of course to ME program outcomes:
The following measurement standard is used to evaluate the relationship between the course outcomes and the educational-program outcomes:

- 2 = Strong Emphasis
- 1 = Some Emphasis
- 0 = Little or No Emphasis

(a) an ability to apply knowledge of mathematics, science, and engineering—2
(b) an ability to design and conduct experiments, as well as to analyze and interpret data—1
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability—2
(d) an ability to function on multidisciplinary teams—2
(e) an ability to identify, formulate, and solve engineering problems—2
(f) an understanding of professional and ethical responsibility—2
(g) an ability to communicate effectively—2
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context —1
(i) a recognition of the need for and the ability to engage in life-long learning—2
(j) a knowledge of contemporary issues—1
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice—2

Contribution to professional component:

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Science</td>
<td>100%</td>
</tr>
<tr>
<td>Engineering Design</td>
<td>0%</td>
</tr>
</tbody>
</table>

Person(s) who prepared this description:

Craig Somerton

Date of Preparation:

2009, updated 2014