Course alpha, number, title

ME 481 Mechanical Engineering Design Projects

Required or elective

Required

Course (catalog) description


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:

3 = Strong Emphasis, 2 = Some Emphasis, 1 = Little or No Emphasis.

(a) an ability to apply knowledge of mathematics, science, and engineering—3
(b) an ability to design and conduct experiments, as well as to analyze and interpret data—2
(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—3
(d) an ability to function on multidisciplinary teams—3
(e) an ability to identify, formulate, and solve engineering problems—3
(f) an understanding of professional and ethical responsibility—3
(g) an ability to communicate effectively—3
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context —2
(i) a recognition of the need for and the ability to engage in life-long learning—3
(j)  a knowledge of contemporary issues—2
(k)  an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice—3
(l)  application of advanced mathematics—1
(m)  design, build, and test in mechanical systems area—2
(n)  design, build, and test in thermal/fluids area—2
(o)  capstone design experience—3

Contribution to professional component:

0% Engineering Science 100% Engineering Design

Person(s) who prepared this description

Craig Somerton

Date of Preparation

November 3, 2009