Course alpha, number, title

ME 478 Product Development

Required or elective

Elective

Course (catalog) description

Simulation of industrial environment for product development. Product concept, design, and manufacturing.

Prerequisite(s)

(ME 477) and completion of Tier I writing requirement.

Textbook(s) and/or other required material

No Required Textbook

Class/Lab schedule:

Total Credits: 3 Lecture/Laboratory/Discussion Hours: 3/0/0

Topics covered

(a) Individual Conceptual Design  
(b) Computer aided design  
(c) Manufacturing process  
(d) Relationship between design and manufacturing  
(e) Group Design and Manufacturing

Course learning objectives

Upon successful completion of this course, the student shall have:

1. An ability to design a system, component, or process to meet desired needs: for a term project: a product is focused in order to identify a variety of design and manufacturing processes.  
   [L: Application] [M: Project Report]

2. An ability to function on multi-disciplinary teams: the course is focused on various aspects of manufacturing; including a multi-disciplinary team from materials science and mechanical engineering.  
   [L: Application] [M: Project Report]

3. An ability to identify, formulate, and solve engineering problems: projects require solving new problems based on the fundamentals developed in class as well as other prerequisites; requires logical development and presentation of new solutions based on engineering background.  
   [L: Application] [M: Project Report]

4. An understanding of professional and ethical responsibility: the consequences of failing to properly consider at various stages of manufacturing are discussed in a number of scenarios.  
   [L: Application] [M: Project Report]

5. An ability to communicate effectively: the need for strong written and oral communications is reinforced with a term project: the broad education necessary to understand the impact of engineering solutions in a global and societal context: some manufacturing processes are presented with overall cost and benefit issues in a global and social context.  
   [L: Application] [M: Project Report]

6. Recognition of the need for, and an ability to engage in life-long learning: students are encouraged to participate in the SME and ASME student chapters.  
   [L: Application] [M: Project Report]

7. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice: calculators are used to make predictions using mathematical models. New developments in the topic related to manufacturing are introduced.  
   [L: Application] [M: Project Report]

Relationship of course to ME

The following measurement standard is used to evaluate the relationship between the course outcomes and the educational-program outcomes:
<table>
<thead>
<tr>
<th>Program outcomes</th>
<th>2 = Strong Emphasis, 1 = Some Emphasis, 0 = Little or No Emphasis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>an ability to apply knowledge of mathematics, science, and engineering—1</td>
</tr>
<tr>
<td>(b)</td>
<td>an ability to design and conduct experiments, as well as to analyze and interpret data—0</td>
</tr>
<tr>
<td>(c)</td>
<td>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—1</td>
</tr>
<tr>
<td>(d)</td>
<td>an ability to function on multidisciplinary teams—1</td>
</tr>
<tr>
<td>(e)</td>
<td>an ability to identify, formulate, and solve engineering problems—2</td>
</tr>
<tr>
<td>(f)</td>
<td>an understanding of professional and ethical responsibility—1</td>
</tr>
<tr>
<td>(g)</td>
<td>an ability to communicate effectively—2</td>
</tr>
<tr>
<td>(h)</td>
<td>the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context —1</td>
</tr>
<tr>
<td>(i)</td>
<td>recognition of the need for and the ability to engage in life-long learning—0</td>
</tr>
<tr>
<td>(j)</td>
<td>knowledge of contemporary issues—1</td>
</tr>
<tr>
<td>(k)</td>
<td>an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice—2</td>
</tr>
</tbody>
</table>

**Contribution to professional component:** Engineering Design

**Person(s) who prepared this description:** Patrick Kwon

**Date of Preparation:** 2014