<table>
<thead>
<tr>
<th>Course alpha, number, title</th>
<th>ME 477 Manufacturing Processes</th>
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<tbody>
<tr>
<td>Required or elective</td>
<td>Elective</td>
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<tr>
<td>Course (catalog) description</td>
<td>Fundamentals of manufacturing processes such as casting, heat treating, particulate processing, forming, machining, joining, and surface processing. Selection of manufacturing processes based on design and materials.</td>
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<tr>
<td>Prerequisite(s)</td>
<td>(ME 222 and MSE 250) and completion of Tier I writing requirement.</td>
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<tr>
<td>Textbook(s) and/or other required material</td>
<td>M.P. Groover, fundamentals of Modern Manufacturing: materials, Processes and Systems, Wiley 2007</td>
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<tr>
<td>Class/Lab schedule:</td>
<td>Total Credits: 3 Lecture/Laboratory/Discussion Hours: 3/0/0</td>
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| Topics covered            | (a) Materials and Physical Properties  
(b) Casting  
(c) Material removal  
(d) Material fastening  
(e) Metal forming  
(f) Sheet metal fabrication  
(g) Joining processes  
(h) Surface technology  
(i) Non-traditional manufacturing  
(j) Environmentally-sensitive engineering  
(k) Concurrent product development  
(l) Evaluation of alternative concepts: decision theory |
| Course learning objectives | The student shall be able to  
(1) Use knowledge from materials science and engineering design to address manufacturing problems.  
(2) Explain the relationships among microstructure, properties and manufacturing processes.  
(3) Select appropriate manufacturing processes based on design and material properties.  
(4) Understand the advantages and disadvantages of using various processing techniques. |
| 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—1  
(b) an ability to design and conduct experiments, as well as to analyze and interpret data—0  
(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—1  
(d) an ability to function on multidisciplinary teams—1  
(e) an ability to identify, formulate, and solve engineering problems—2  
(f) an understanding of professional and ethical responsibility—0  
(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 —2 |
(i) a recognition of the need for and the ability to engage in life-long learning—0
(j) a knowledge of contemporary issues—2
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice—0

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<thead>
<tr>
<th>Contribution to professional component:</th>
<th>Engineering Science, Engineering Design,</th>
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<tbody>
<tr>
<td>Person(s) who prepared this description</td>
<td>Brian Thompson</td>
</tr>
<tr>
<td>Date of Preparation</td>
<td>2009, updated 2014</td>
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