EMCH 509 - Computer-Aided Manufacturing

Credit hours – 3  Contact hours – 50 minutes MWF or 75 minutes TTh

Instructor – Not taught since 2005 ABET visit


Specific Course information:

a. **EMCH 509 - Computer-Aided Manufacturing.** (3) Fundamental concepts in computer-aided manufacturing (CAM). Numerically controlled manufacturing systems, computer controls in manufacturing, industrial robots, group technology and process planning, integrated manufacturing systems.

b. **Prerequisites:** EMCH 367

c. **Mechanical Engineering Elective**

Course Goals:

a. **Outcomes**

1. Students will demonstrate the ability to optimize the feed, speed, and depth of cut during milling, turning, and drilling operations on multi-tool and multi-spindle processes.

2. Students will demonstrate the ability to perform boolean logic, and ladder logic in order to program PLCs.

3. Students will demonstrate the ability to develop first- and second-order control systems and how to optimize closed-loop feedback gains to quicken the response and increase the accuracy of positional servo-mechanisms.

4. Students will demonstrate the ability to perform basic CNC programming to direct a CNC milling machine to machine a part.

b. **Relationship of Course to Program Objectives:** The importance of each course objective to meeting the program outcomes is indicated with the following scale: 3 = major importance; 2 = moderate importance; 1 = minimal importance. Blank if not related.

<table>
<thead>
<tr>
<th>Program Outcomes (see list for complete description)</th>
<th>CO 1</th>
<th>CO 2</th>
<th>CO 3</th>
<th>CO 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. analyze, design and realize</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>1.2. computation techniques</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1.3. design and interpret experiments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4. apply linear algebra, calculus</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5. apply statistical methods</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.6. understand chemistry and physics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.1. engineering economic analyses
2.2. plan and execute projects
2.3. oral and written communications
2.4. professional responsibility
2.5. multi-disciplinary teams
2.6. life-long learning
3.1. engineering in modern society
3.2. literature, arts, humanities.
3.3. foreign language

Topics Covered:
1. Machining
2. Programmable Logic Controllers (PLCs)
3. Motion Control
4. NC Part Programming

Person Who Prepared This Description and Date of Preparation:
David N. Rocheleau, 02/02/2005