A Flexible Adaptation Framework for Implementing 'Learning Factory'-Based Manufacturing Education

Program for Faculty Development Workshop

Delia J. Valles and Edward Pines
Department of Industrial Engineering
Nov 7, 2008
Agenda

• Courses you expect to be impacted by the project
• Capability of supporting laboratories
• Potential product to be used as project theme
• Nature of local industry most likely to benefit
## Courses you expect to be impacted by the project

<table>
<thead>
<tr>
<th>NMSU</th>
<th>COURSE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME159 Graphical Communication and Design</td>
<td>Sketching and orthographic project. Detail and Assembly drawings, dimensioning, tolerancing, and design projects</td>
<td></td>
</tr>
<tr>
<td>IE217 equiv. ME222 Manufacturing Processes I</td>
<td>Manufacturing methods and industrial Processes which include casting, forming, and machining (includes lab.)</td>
<td></td>
</tr>
<tr>
<td>IE375 Manufacturing Processes II</td>
<td>Review of IE217. Advanced topics in selected processes, process parameters, and economic processes</td>
<td></td>
</tr>
<tr>
<td>IE480 equiv. ME426/ME427 Senior Design</td>
<td>Multidisciplinary team design project for external clients. Includes design report and presentation.</td>
<td></td>
</tr>
</tbody>
</table>
Capability of supporting laboratories

- Computer laboratories
- Manufacturing laboratories
The manufacturing lab houses an extensive machine shop including large 4 axis CNC mills. This lab is also equipped with a small foundry along with fabrication and sheet metal equipment. The layout of this facility is for instructional purposes.
This lab contains measurement and inspection equipment that is used for quality control, statistic process control and ISO 9000 standards, along with surface measurement and non-destructive testing capabilities.
Student Project Center
Potential product to be used as project theme

• Selection of a product that
  – It will be designed and manufactured according to local industry needs
  – According to the various research projects available from Faculty
Nature of local industry most likely to benefit

- Manufacturing
  - Military
  - Research Centers: Sandia Labs, Los Alamos National Laboratories
  - Electronics Industry
  - Food Industry
  - Traditional Manufacturing
    - Injection Molding
    - Machining Shops

- Example of companies hiring our undergraduate students:
  - Ethicon
  - Intel
  - Raytheon
  - Texas Instruments
  - General Motors
  - Boeing
  - Ford
  - Delphi
  - General Electric
  - Tyson Foods