Course Outline for Industrial Technology 62
ADVANCED MANUFACTURING OPERATIONS

Catalog Description:

INDT 62 - Advanced Manufacturing Operations 3.00 units
Advanced manufacturing operational processes, including lean manufacturing, statistical process control (SPC or "six-sigma"), and quality management systems (e.g. ISO 9000). Examination of the impact of Big Data on manufacturing operations.

Requisites: none

Grading Option: Letter Grade

Discipline:

<table>
<thead>
<tr>
<th>Units</th>
<th>Contact Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Lecture</td>
<td>3</td>
</tr>
<tr>
<td>Laboratory</td>
<td>0</td>
</tr>
<tr>
<td>Clinical</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>3.00</td>
</tr>
</tbody>
</table>

Prerequisite Skills:
None

Measurable Objectives:

Upon completion of this course, the student should be able to:
1. describe the elements of a lean manufacturing process;
2. describe the benefits of implementing lean manufacturing;
3. discuss the barriers to implementation of lean manufacturing in an established operation;
4. compare a statistical process control quality system with a "pass/fail" quality control system;
5. describe the elements of a quality management system, such as ISO 9000;
6. define Big Data, and describe the deployment and impact of Big Data analysis on manufacturing operations.

Course Content:
1. The birth of lean
2. Lean production systems
3. Stability
4. Standardized work
5. Just-in-time production
6. Jidoka
7. Involvement
8. Hoshin planning
9. The culture of lean production
10. Quality management systems
11. Big Data in manufacturing

Methods of Presentation
1. Case Study
2. Field Trips
3. Guest speakers
4. Lecture/Discussion
5. Online Assignments
6. Textbook reading assignments
7. Written assignments

Assignments and Methods of Evaluating Student Progress

1. Typical Assignments
   A. After a tour of a lean manufacturing facility, write a summary of your observations.
   B. Compare and contrast the effects of JIT and Jidoka on a manufacturing operation.

2. Methods of Evaluating Student Progress
   A. Exams/Tests
   B. Final Examination or Project
   C. Group Projects
   D. Homework

3. Student Learning Outcomes
   Upon the completion of this course, the student should be able to:
   A. The student will describe the key elements of a lean production system and the benefits of lean production.
   B. The student will describe the key concepts of statistical process control, and provide examples of how this is implemented in a manufacturing operation.
   C. The student will compare and contrast Big Data vs. traditional RDBMS and provide examples of how Big Data impacts a
manufacturing operation.

Textbook (Typical):

Special Student Materials

Abbreviated Class Schedule Description:

Advanced manufacturing operational processes, including lean manufacturing, statistical process control (SPC or "six-sigma"), and quality management systems (e.g. ISO 9000). Examination of the impact of Big Data on manufacturing operations.

Requisites: none