

Prepared by the Department of Natural Sciences & Applied Technology

Date of Departmental Approval: November 3, 2014

Date Approved by Curriculum and Programs: December 3, 2014

Effective: Spring 2015

1. **Course Number:** ENR206  
**Course Title:** Quality Manufacturing
2. **Description:** Quality manufacturing is about a philosophy and set of strategies for reducing waste as well as the time required to go from customer order to delivery of a product, with higher quality, less cost, space, and inventory. Learn the techniques for identifying and removing waste within the engineering and manufacturing process as well as methods for improving the "flow" or smoothness of work through a manufacturing environment. As waste is eliminated, quality improves while production time and cost are reduced.
3. **Student Learning Outcomes** (instructional objectives, intellectual skills):  
Upon successful completion of this course, students are able to do the following.
  - List and explain the key elements of total quality.
  - Discuss Deming's and Juran's main contributions to the quality movement.
  - Explain how a certain manufacturing behavior could be legal but not ethical.
  - Describe the stages of development in supplier partnerships.
  - Explain why the implementation of total quality requires cultural change.
  - Diagram and explain the six-step strategy for identifying customer needs.
  - Explain briefly the concept of Quality Function Deployment (QFD) and how it relates to customer satisfaction.
  - Compare and contrast the aims and origins of ISO 9000 and total quality.
  - Describe and demonstrate the use of total quality tools such as pareto charts, cause-and-effect diagrams, and histograms.
  - Explain the difference between design FMEA and process FMEA.
  - Describe the Toyota TPS method for problem solving.
  - Define Quality Function Deployment and debate its effectiveness.
  - Describe the basic structure of and rationale for the QFD House of Quality.
  - Demonstrate the function of an affinity diagram
  - Compare and contrast methods for optimizing and controlling processes through statistical process control (SPC).
  - Summarize continual improvement methods using six sigma, lean, and lean six sigma.
  - Explain the concept of Kaizen.
  - Describe how the Theory of Constraints addresses Continual Improvement and how it differs from other approaches.
  - Explain the importance of benchmarking.
  - Discuss the difference between the traditional production system and just-in-time/lean manufacturing (JIT/LEAN) system.
  - List and explain the seven wastes enumerated by Taiichi Ohno.
  - Compare and contrast a pull system and a push system including how each one is started.
  - Argue why JIT/Lean should be a part of a total quality system?
  - Describe JIT/Lean's objectives relative to inventory and WIP.
4. **Credits:** 3 credits (3 class hours)
5. **Satisfies General Education Requirement:** No
6. **Prerequisite(s):** ENR101
7. **Semester(s) Offered:** Varies
8. **Suggested General Guidelines for Evaluation:** The course grade will be based on homework assignments; class work and participation; one-hour exam(s); and a final examination. Specific course grading procedures and make-up policies are detailed in a student handout.
9. **General Topical Outline** (Optional):