

# **Common Course Outline**

## **EMET 230**

### **Advanced Lean Concepts**

**3 Semester Hours**

## **The Community College of Baltimore County**

### **Description**

#### **EMET 230 – 3 Credits – Advanced Lean Concepts**

introduces students to the essential elements of the product planning, product design, production planning, and production operation cycles required to develop and manufacture a product using world-class manufacturing techniques.

Participants develop data collection, analysis, and presentation skills; a working understanding of measures of central tendency, variability, and the normal curve; an increased comfort level with statistics; and an awareness of the usefulness of statistics to manufacturing. By taking part in simulations of real-life situations, participants get hands-on experience with quality-management techniques that have evolved to improve the whole system of manufacturing.

3 Credits: 3 lecture hours per week

Prerequisite: EMET 115 – Introduction to Lean

### **Course Objectives**

Upon successful completion of this course the student will be able to:

1. provide an overview of the scope of the manufacturing process and key components of the product design process;
2. develop and implement a production plan for a product design to manufacture a finished product;
3. evaluate products and processes against specifications and quality standards;
4. perform reverse engineering to determine the feasibility of manufacturing a product;

5. explain the uses for statistical data, and the methods used to calculate and interpret measures of central tendency;
6. use a histogram and frequency chart to record and analyze random variability;
7. use statistical analysis to test for normal distribution and monitor processes in a simulation exercise;
8. relate quality principles to their application and impact in organizations;
9. identify the relationship between an enterprise (as a system) and all of its customers;
10. create a system map for a single facility system that incorporates the needs of internal and external customers;
11. identify the impact of variation on quality, and strategies for managing that impact;
12. develop a repeatable solution to a quality problem using the Theory of Knowledge and the Plan-Do-Study-Act cycle;
13. implement change required to realize improvement using knowledge of barriers, enhancers, and world-class quality practices;
14. use tools of world class quality (force field analysis, control charts, system diagrams, and process documentation) to develop approaches to solving problems; and
15. apply quality principles in a scenario-based learning event to implement individual and organizational improvement.

### **Major Topics**

- I. Introduction to World Class Manufacturing
- II. The Product Realization Process
- III. The Total Manufacturing Enterprise
- IV. Basic Statistical Variation
- V. Data Analysis
- VI. Quality Foundations
- VII. Theory of Knowledge
- VIII. Change Implementation

## **Course Requirements**

Grading/exams: Grading procedures will be determined by the individual faculty member and will be provided on the first day of class.

The following will be required for this course:

1. Written paper or suitable practical project
2. Midterm exam
3. Comprehensive final (including a practical exam).

*In addition, students can expect additional grades from the following areas:*

4. Quizzes
5. Homework Assignments

## **Other Course Information**

**EMET 230 – Advanced Lean Concepts** is a course offered in the Mechanical Engineering Technology option of the Engineering Technology Program. It is taught in a classroom environment, and includes hands-on activities which allow students to apply the knowledge they acquire during lecture sessions.