

## Master Syllabus

### OPT 2201 - Statistical Process Control

**Division:** Science, Mathematics and Engineering

**Department:** Operations Technology

**Credit Hour Total:** 3.0

**Lecture Hrs:** 2.0 **Lab Hrs:** 2.0

**Prerequisite(s):** OPT 1101 AND MET 1131

**Date Revised:** January 2017

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### Course Description:

Emphasis on process capability, control charts, techniques and analysis. This is followed by more advanced study of reliability, quality function deployment, design of experiments, failure mode effects analysis and quality costs. Two classroom, two lab hours per week.

### General Education Outcomes:

- Critical Thinking/Problem Solving Competency

### Course Outcomes:

#### Reliability Testing, Evaluation & Prediction

Apply the laws of reliability to test, determine, evaluate and predict the reliability of systems and components and devise ways for reliability improvement.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

Correctly Answer 70% of Exam Questions

#### Advanced Topics in Quality

Apply techniques such as Quality Function Deployment, Design of Experiments, Failure Mode and Effects Analysis, and Quality Costs to further analyze and suggest improvements to existing and proposed systems.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

Correctly Answer 70% of Exam Questions

#### Hypothesis Testing & Factorial Designs

Apply hypothesis testing to verify differences in means, variance and standard deviation of data from designed experiments.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

Correctly Answer 70% of Exam Questions

#### Forms of Variability & Process Dominance

Select appropriate techniques used to control and reduce variation.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

Correctly Answer 70% of Exam Questions

#### Measurement Systems Analysis

Apply the concepts of Measurement Systems Analysis and select appropriate techniques used to evaluate, control and reduce variation. Apply the concepts of Measurement Systems Analysis and select appropriate techniques used to evaluate, control and reduce variation.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

Correctly Answer 70% of Exam Questions

#### Data Collection, Analysis & Interpretation

Acquire, analyze and interpret data from a process to determine if that process data is normally distributed, is in statistical control and capable of meeting customer requirements; and interpret data collected from experimental designs for hypothesis testing.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

Correctly Answer 70% of Exam Questions

#### Problem Solving Techniques

Apply problem solving techniques to the development of an improvement plan for processes that are not in statistical control and/or not capable of meeting customer requirements.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

Correctly Answer 70% of Exam Questions

**Outline:**

Descriptive Statistics and Histograms

Measurement Systems Analysis

Normal Distribution & Calculations

Variable and Attribute Control Charts

Process Capability

Probability

Reliability

Quality Function Deployment

Design of Experiments

Failure Mode Effects Analysis

Quality Costs