

## Master Syllabus

### OPT 1113 - Coordinate Measurement

**Division:** Science, Mathematics and Engineering

**Department:** Operations Technology

**Credit Hour Total:** 3.0

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

**Prerequisite(s):** OPT 1100

**Date Revised:** October 2013

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### Course Description:

Course will prepare students to use and program coordinate measurement machines, apply Geometric Dimensioning and Tolerancing (GD&T) principles, use advanced operating techniques for a servo driven coordinate measuring device. Two classroom, two lab hours per week.

### General Education Outcomes:

- ❑ Oral Communication Competency
- ❑ Written Communication Competency
- ❑ Critical Thinking/Problem Solving Competency
- ❑ Values/Citizenship/Community Competency
- ❑ Computer Literacy Competency
- ❑ Information Literacy Competency

### Course Outcomes:

#### Computerized Measuring Machines

describe and demonstrate the basic theories of metrology and machining to the use of computerized measuring machines.

**Assessment Method:** Locally developed exams

**Performance Criteria:** At least 70% of students achieve a score of 70% or better on questions related to these topics

**Assessment Method:** Performance appraisals

**Performance Criteria:** 70% of students score a "4" or better on 5-point rubric

#### Rectangular & Polar Coordinates

Construct a part in 3-dimensional space and define rectangular and polar coordinates.

**Assessment Method:** Locally developed exams

**Performance Criteria:** At least 70% of students achieve a score of 70% or better on questions related to these topics

**Assessment Method:** Performance appraisals

**Performance Criteria:** 70% of students score a "4" or better on 5-point rubric

#### Direct Computer Controlled Measurement Program

Create a direct computer controlled measurement program for a computer controlled coordinate measuring machine that will measure the dimensional characteristics of a sample part.

**Assessment Method:** Simulations

**Performance Criteria:** 70% of students score a "4" or better on measurement program rubric

### Outline:

Basic Metrology  
Advanced Metrology  
Geometric Dimensioning and Tolerancing (GD&T)  
Uses of Coordinate Measuring Machines (CMMs)  
Theory of CMMs  
Rectangular & Polar Coordinates  
Safe Operations of CMMs  
Accuracy/Precision  
Reliability  
Repeatability  
Gage R&R  
Programming CMMs  
Troubleshooting CMMs