

# SYLLABUS

**DIVISION:** Business and Engineering Technology

**REVISED:** Fall 2014

**CURRICULA IN WHICH COURSE IS TAUGHT:** Precision Machining Technology

**COURSE NUMBER AND TITLE:** MAC 209 – Standards, Measurements, & Calculations

**CREDIT HOURS: 3 HOURS/WK LEC: 3 HOURS/WK LAB: 0 LEC/LAB COMB: 3**

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## I. CATALOG DESCRIPTION:

- Presents typical mathematical and mechanical problems requiring the use of various tools and/or gauges as well as reference sources such as the Machinery's Handbook for solution.
- Presents the use of the Coordinate Measuring Machine for precise and efficient quality assurance of machined parts.

## II. RELATIONSHIP OF THE COURSE TO CURRICULA OBJECTIVES:

- This course emphasizes quality control and the instruments used to verify it.

## III. REQUIRED BACKGROUND/PREREQUISITES:

- MAC 221

## IV. COURSE CONTENT:

1. Systems of Measurement
  - a. English
  - b. SI (Metric)
  - c. Conversions
2. Measuring Instruments
  - a. Calibration
  - b. Use
  - c. Care
  - d. Angular measurements
  - e. Sine bars
  - f. Gage blocks
  - g. Plug and ring gages
  - h. Effects of temperature
3. Geometric Dimensioning and Tolerancing
  - a. Symbols
  - b. Feature Control Frame
  - c. Form Tolerance
    - i. Straightness
    - ii. Flatness
    - iii. Circularity (Roundness)
    - iv. Cylindricity
  - d. Profile
    - i. Profile of a Line
    - ii. Profile of a Surface
  - e. Orientation
    - i. Angularity
    - ii. Perpendicularity
    - iii. Parallelism
  - f. Location
    - i. Position
    - ii. Concentricity
    - iii. Symmetry
  - g. Runout
    - i. Circular Runout
    - ii. Total Runout
  - h. Supplementary Symbols
    - i. MMC
    - ii. LMC
    - iii. Projected Tolerance Zone
    - iv. Basic Dimensions
    - v. Datum Feature
    - vi. Datum Target

**V. THE FOLLOWING GENERAL EDUCATION OBJECTIVES WILL BE ADDRESSED IN THIS COURSE (Place X by all that apply)**

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| <input checked="" type="checkbox"/> Communications       | <input type="checkbox"/> Personal Development              |
| <input checked="" type="checkbox"/> Critical Thinking    | <input checked="" type="checkbox"/> Quantitative Reasoning |
| <input type="checkbox"/> Cultural & Social Understanding | <input checked="" type="checkbox"/> Scientific Reasoning   |
| <input checked="" type="checkbox"/> Information Literacy |  |

**VI. LEARNER OUTCOMES**

**VII. EVALUATION**

<p><b>Learner outcome</b></p> <ul style="list-style-type: none"> <li>• Demonstrate the use of English and Metric measuring instruments.</li> <li>• Convert measurements between systems.</li> </ul>	<p><b>Evaluation method</b></p> <p>In class assignments Written tests</p>
<p><b>Learner outcome</b></p> <ul style="list-style-type: none"> <li>• Demonstrate proper use, calibration, and care of various measuring instruments and tools.</li> </ul>	<p><b>Evaluation method</b></p> <p>In class assignments Written tests</p>
<p><b>Learner outcome</b></p> <ul style="list-style-type: none"> <li>• Calculate angular measurements.</li> <li>• Calculate and wring gage block stacks</li> <li>• Demonstrate proper use of a sine bar.</li> </ul>	<p><b>Evaluation method</b></p> <p>In class assignments Written tests</p>
<p><b>Learner outcome</b></p> <ul style="list-style-type: none"> <li>• Demonstrate applications and use of plug and ring gages.</li> </ul>	<p><b>Evaluation method</b></p> <p>In class assignments Written tests</p>
<p><b>Learner outcome</b></p> <ul style="list-style-type: none"> <li>• Recognize geometric symbols and tolerancing methods and their applications.</li> </ul>	<p><b>Evaluation method</b></p> <p>In class assignments Written tests</p>
<p><b>Learner outcome</b></p> <ul style="list-style-type: none"> <li>• Understand the effects of temperature as it relates to metrology.</li> </ul>	<p><b>Evaluation method</b></p> <p>In class assignments Written tests</p>

**VIII. Over 90% of students will successfully complete this class.**