

# SYLLABUS

**DIVISION:** Business and Engineering Technology

**REVISED:** Spring 2014

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

**COURSE NUMBER AND TITLE:** MAC 223 – Advanced Machine Tool Operations III

**CREDIT HOURS:** 7 **HOURS/WK LEC:** 4 **HOURS/WK LAB:** 9 **LEC/LAB COMB:** 13

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## **I. CATALOG DESCRIPTION:**

- Focuses on advanced lathe and millwork with concentration on fits, finishes, inspection, quality control, and basic heat-treating.
- Includes design and construction of specific projects to determine the student's operational knowledge of all equipment.

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

- To further develop the students' skills and understanding of precision machining with emphasis on developing speed and accuracy of projects.

## **III. REQUIRED BACKGROUND/PREREQUISITES:**

- MAC 222

## **IV. COURSE CONTENT:**

- A. Continuation of Advanced Milling and Lathe Procedures
- B. Grinding and Abrasive Machining Processes
  1. Selection & Identification of Grinding Wheels
  2. Truing, Dressing, and Balancing Grinding Wheels
  3. Grinding Fluids
  4. Surface Grinders
  5. Work Holding on Surface Grinders
  6. Using the Surface Grinder
  7. Problems & Solutions in Surface Grinding
  8. Cylindrical Grinders
  9. Universal Tool and Cutter Grinder
- C. Advanced Processes
  1. Job Planning
  2. Jigs and Fixtures
  3. EDM
  4. Laser
  5. Water Jet

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

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|--|-------------------------------------|
| <u>  X  </u> Communications                  | <u>  X  </u> Personal Development   |
| <u>  X  </u> Critical Thinking               | <u>  X  </u> Quantitative Reasoning |
| <u>  X  </u> Cultural & Social Understanding | <u>      </u> Scientific Reasoning  |
| <u>  X  </u> Information Literacy            |                                     |

**VI. LEARNER OUTCOMES**

**VII. EVALUATION**

<b>Learner outcome</b> <ul style="list-style-type: none"> <li>Demonstrate ability to machine complex parts with proper allowances for grinding.</li> </ul>	<b>Evaluation method</b> Lab exercises In class assignments
<b>Learner outcome</b> <ul style="list-style-type: none"> <li>Demonstrate ability to machine precise tapers and complex geometries on a lathe.</li> </ul>	<b>Evaluation method</b> Lab exercises In class assignments
<b>Learner outcome</b> <ul style="list-style-type: none"> <li>Demonstrate the ability to select the proper grinding wheel and mount, true, and dress surface grinder wheels.</li> </ul>	<b>Evaluation method</b> Lab exercises In class assignments Written tests
<b>Learner outcome</b> <ul style="list-style-type: none"> <li>Demonstrate the ability to set-up and operate a surface grinder to grind parts to print specifications.</li> </ul>	<b>Evaluation method</b> Lab exercises In class assignments Written tests
<b>Learner outcome</b> <ul style="list-style-type: none"> <li>Demonstrate ability to safely setup and operate the universal tool and cutter grinder to sharpen endmills, reamers, and drills.</li> </ul>	<b>Evaluation method</b> Lab exercises In class assignments Written tests
<b>Learner outcome</b> <ul style="list-style-type: none"> <li>Demonstrate the ability to identify various components of advanced machining equipment, jigs, and fixtures.</li> <li>Demonstrate proper job planning abilities.</li> </ul>	<b>Evaluation method</b> Lab exercises In class assignments Written tests

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