

# Des Moines Area Community College

## Course Information – EFFECTIVE Aug. 2006

Acronym/Number CAD 240 Historical Ref CADT 425

Title Applied Materials and Processes

Credit breakout 3                      2                      2                      0                      0  
(credit                      lecture                      lab                      practicum                      work experience)

PREREQUISITE(S): None

### COURSE DESCRIPTION:

Standard industrial raw materials and forming processes will be examined. Students will see various machining, forming and welding operations. Field trips to industry will be offered.

### COURSE COMPETENCIES:

*During this course, the student will be expected to:*

1. Identify standard materials.
  - 1.1 Identify ferrous materials.
  - 1.2 Identify non-ferrous materials.
  - 1.3 Identify elastomers.
2. Discuss the casting process.
  - 2.1 Examine sand castings.
  - 2.2 Examine die castings.
  - 2.3 Discuss non-traditional castings.
  - 2.4 Discuss post-processing of castings.
3. Analyze hot working metals.
  - 3.1 Discuss forgings.
    - 3.1.1 Discuss upset forgings.
  - 3.2 Identify hot rolled parts.
    - 3.2.1 Identify tubing.
    - 3.2.2 Identify extrusions.
4. Analyze cold working metals.
  - 4.1 Identify cold working materials.
  - 4.2 Discuss the cold drawing process.
  - 4.3 Examine cold drawn parts.
    - 4.3.1 Identify tubing.
    - 4.3.2 Identify wire.
  - 4.4 Discuss the cold-headed process.
5. Discuss inspection measuring systems and instruments.
  - 5.1 Examine non-precision measuring systems.

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- 5.2 Examine semi-precision measuring systems.
- 5.3 Examine precision measuring systems.
  
- 6. Identify basic cutting tools.
  - 6.1 Examine basic turning tools.
    - 6.1.1 Identify external turning tools.
    - 6.1.2 Identify internal turning tools.
  - 6.2 Examine basic drills.
    - 6.2.1 Identify reams.
    - 6.2.2 Identify counterbores.
    - 6.2.3 Identify countersinks.
  - 6.3 Examine basic mills cutters.
    - 6.3.1 Identify vertical mill cutters.
    - 6.3.2 Identify horizontal mill cutters.
    - 6.3.3 Discuss profile mills.
  
- 7. Discuss basic turning operations.
  - 7.1 Identify lathe operations.
  - 7.2 Discuss safety precautions.
  
- 8. Examine basic turning operations.
  - 8.1 Examine facing operation.
  - 8.2 Examine turning operation.
  - 8.3 Examine knurling operation.
  - 8.4 Examine drilling/boring operation.
  
- 9. Discuss basic milling operations.
  - 9.1 Discuss up (climb) milling.
  - 9.2 Discuss down milling.
  - 9.3 Discuss vertical mills.
  - 9.4 Discuss horizontal mills.
  - 9.5 Discuss plunge cutting.
  - 9.6 Discuss shop safety.
  
- 10. Examine mill operations.
  - 10.1 Examine mill operation. (Instructors choice.)
  - 10.2 Examine plunge cutting.
  
- 11. Examine basic sheet metal operations.
  - 11.1 Discuss punch press operations.
  - 11.2 Discuss brake bending operations.
  
  - 11.3 Discuss hand forming operations.
    - 11.3.1 Discuss slitting operation.
  - 11.4 Discuss safety precautions.
  
- 12. Examine basic sheet metal bends.
  - 12.1 Examine 90 degree bends.

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- 12.2 Examine greater than 90 degree bends.
- 12.3 Examine less than 90 degree bends.
- 12.4 Examine compound bending.
  
- 13. Examine basic welding.
  - 13.1 Examine basic fillet welds.
  - 13.2 Examine basic plug welds.
  - 13.3 Examine basic butt welds.
  - 13.4 Examine basic single-v welds.
  - 13.5 Examine basic double-v welds.
  - 13.6 Examine basic flare-v welds.
  - 13.7 Examine basic flange edge welds.
  - 13.8 Examine basic torch cutting.
  - 13.9 Discuss welding operation/application problems.
  
- 14. Examine non-traditional fabrication methods.
  - 14.1 Discuss chemically milled parts.
  - 14.2 Discuss laser etched parts.
  - 14.3 Discuss discharged electrically milled parts.
    - 14.3.1 Examine wire EDM.
  
- 15. Identify standard plastics.
  - 15.1 Examine thermoset plastics.
  - 15.2 Examine thermoplastic plastics.
  - 15.3 Identify plastic operations.
    - 15.3.1 Examine plastic injection molding.
  
- 16. Analyze basic printed circuit card construction.
  - 16.1 Identify standard printed circuit card materials.

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**COMPETENCIES REVIEWED AND APPROVED BY:**

**DATE:** \_\_\_\_\_

**FACULTY:**

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Effective date: 7/27/96

by: J. Leetch

Campus: A B C U N W OC

extension: 6377

Revision(s): 7/96;