

COURSE SYLLABUS

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| LAST REVIEW | Fall 2022 |
| COURSE TITLE | CAD/CAM III |
| COURSE NUMBER | MACH 0206 |
| DIVISION | Career and Technical Education |
| DEPARTMENT | MACH |
| CIP CODE | 48.0501 |
| CREDIT HOURS | 4 |
| CONTACT HOURS/WEEK | Class: 1 Lab: 6 |
| PREREQUISITES | MACH 0204, MACH 0205 |

COURSE DESCRIPTION

The learner will be introduced to work coordinates and also work groups that are required to create a 3 dimensional drawing to produce multi axis machining operations. 3, 4, and 5 axis machining practices will be implemented.

PROGRAM ALIGNMENT

This course is part of a program aligned through the Kansas Board of Regents and Technical Education Authority. For more information, please visit:
https://kansasregents.org/workforce_development/program-alignment

PROGRAM LEARNING OUTCOMES

1. Students will be able to create 2D and 3D CNC mill programs using Mastercam software.
2. Students will be able to create 4th and 5th axis CNC mill programs using Mastercam and Solidworks software.
3. Students will be able to program a CNC Lathe using CAM Software

TEXTBOOKS

<http://kckccbookstore.com/>

METHODS OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. General applications
 - A. Introduction
 - B. Rotary positioning
 - C. Machining with coordinate systems.
 - D. Solids
- II. Coordinate systems
 - A. What are coordinate systems
 - B. Multiple coordinate systems
 - C. Creating coordinate systems
 - D. Minimum plane rotation
- III. Part set-up
 - A. Rotary set-up
 - B. Four axis set-ups
 - C. Five axis set-ups
 - D. Clearance planes
- IV. Rotary tables and tombstones
 - A. Work fixture offsets
 - B. Axial alignment
 - C. Multiple part organs
- V. Solids
 - A. Modeling
 - B. Machining solids
 - C. Solid modeling

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

- A. Recognize requirements for system to operate.
 - 1. Determine if computer meets requirements to run software.
 - 2. Identify systems requirements.
- B. Identify system prompts.
 - 3. React to system messages.
 - 4. Take corrective actions to satisfy alarms.
- C. Identify multi coordinate systems.
 - 5. Identify multiple coordinate systems.
 - 6. Create a coordinate system.
 - 7. Create multiple coordinate systems.
 - 8. Recognize minimum rotational planes.

- D. Identify rotary machining methods.
 - 9. Identify rotary fixtures.
 - 10. Setup rotary systems.
 - 11. Identify axis nomenclature. A Axis.

- E. Identify four axis methods.
 - 12. Set software to accept four axis machining.
 - 13. Create four axis machining programs.

- F. Identify five axis methods.
 - 14. Set software to accept five axis machining.
 - 15. Create five axis machining programs.

- G. Identify and create plane rotations.
 - 16. Identify rotary setups within the software.
 - 17. Set-up part documentation for rotary machining.

- H. Work fixture offsets.
 - 18. Identify work fixture offsets.
 - 19. Create offsets for machining process.

- I. Identify axial offsets.
 - 20. Recognize when axial offsets are required.
 - 21. Create axial offsets.

- J. Create multiple work fixture organ offsets.
 - 22. Set-up software to accept multiple part offsets.
 - 23. Create several parts with multiple offsets.

- K. Set-up rotary devices
 - 24. Identify rotary fixtures.
 - 25. Create parts that require rotary machining process.

- L. Create clearance planes for rotary devices.
 - 26. Identify with why required clearance planes are necessary with rotary attachments.
 - 27. Create necessary clearance planes for rotary attachments.

- M. Identify tombstones.
 - 28. Identify with why required clearance planes are necessary for tombstones.
 - 29. Create necessary clearance planes for tombstone attachments.

- N. Recognize solids.
 - 30. Identify a solid program.
 - 31. Create solids.

- O. Identify modeling.
 - 32. Identify a solid model vs. a solid surface.
 - 33. Create a solid model.

- P. Create solid modeling machining methods.
 - 34. Create several machine drawings with tooling and sequence of operations.

- Q. Create programs for machining solids.
 - 35. Create solid programs.
 - 36. Create full programs required for solid machining.

ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.