

## **COURSE SYLLABUS**

<b>LAST REVIEW</b>	Fall 2022
<b>COURSE TITLE</b>	Machine Tool Processes
<b>COURSE NUMBER</b>	MACH 0107
<b>DIVISION</b>	Career and Technical Education
<b>DEPARTMENT</b>	MACH
<b>CIP CODE</b>	48.0501
<b>CREDIT HOURS</b>	1
<b>CONTACT HOURS/WEEK</b>	Class: 1                      Lab:
<b>PREREQUISITES</b>	None

### **COURSE DESCRIPTION**

This course will introduce the learner with the hazards that may be found in an industrial type setting. And will emphasize how to make quality suggestive changes, It will also concentrate on tool selection for a particular job and allow the student to make sound decisions in estimating, and machine cycle times. Group problem solving skills will be applied in this course to brainstorm cost analysis and tool geometry.

### **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](https://kansasregents.org/workforce_development/program-alignment)

### **PROGRAM LEARNING OUTCOMES**

1. Students will be able to read and interpret drawings and translate them into physical parts made from a variety of materials using manually operated machine tools
2. Students will be able to set up and safely operate manually operated machine tools.
3. Students will be able to inspect machined parts to verify dimensions fall within specified tolerances using a variety of precision measuring tools.
4. Students will be able to plot tool paths for CNC lathe and CNC mill parts in G-code from technical drawings.
5. Student will be able to accurately calculate proper machining feeds, speeds, and formulas.

## **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. Intro to Tool Design.
  - A. Importance of interchangeability.
  - B. Determination of proper tools selection.
  - C. Precautions associated with cutting fluids.
  - D. Identification of carbide inserts numbering systems.
  - E. Work holding systems.
  - F. Recordkeeping.
- II. Conducting shop inspections.
  - A. Job hazard analysis.
  - B. Exit signs and locations.
  - C. Fire extinguisher locations and how it is operated.
  - D. Understands and participates in disaster control exercises.
  - E. Hazards associated with machine shops.
  - F. Proper dress for industry.
  - G. Proper cleanliness of shop and related equipment.
- III. Machinery's Handbook.
  - A. Understanding the content for reference within the book.
  - B. Locating Information for standards.
  - C. Hardware identification and limits for fasteners.
  - D. Identify types and classification for fits.
  - E. Location of formulas for common mathematic problems used in manufacturing.
- IV. Mathematical Formulas.
  - A. Calculations to optimize stock.
  - B. Determine waste or stock drop.
  - C. Calculations for part fits.
  - D. Calculations related to thread fits and its importance.
  - E. Calculations for speed and feeds.
  - F. Calculations for chip load vs. equipment horsepower.
- VI. Hand Tools.
  - A. Location of common hand tools.
  - B. Safely uses hand tools.

- C. Identification of wrench types.
- D. Identification of sockets and ratchets.
- E. Selection of snap rings pliers and specialized retention tools.
- F. Defines hammers for uses and application.
- G. Locates and selects proper screwdrivers, pry bars, punches and chisels.

### **COURSE LEARNING OUTCOMES AND COMPETENCIES**

Upon successful completion of this course, the student will:

- A. Select tooling for job planning.
  - 1. Identify and select proper tool holders.
  - 2. Identify carbide inserts for tool holder selected.
  - 3. Install inserts and their holding devices.
  - 4. Maintain logs for tooling used.
  - 5. Select correct inserts to optimize time and finishes
  
- B. Understand the importance of interchangeability
  - 6. Define interchangeability.
  - 7. Describe depth of cuts and its importance.
  - 8. Analyze blueprints to select correct tooling and layout.
  
- C. Perform selecting and diluting cutting fluids
  - 9. Select and apply cutting fluids.
  
- D. Conduct a job analysis.
  - 10. Create job hazard analysis.
  - 11. Identify all shop exits.
  - 12. Locate all firefighting equipment and describe how to use and its uses.
  - 13. Dress correctly for manufacturing.
  - 14. Identify shop hazards.
  - 15. Properly store oily rags.
  - 16. Apply precautions needed to minimize shop hazards with equipment.
  - 17. Adhere to safety equipment use.
  - 18. Summarize preparations for machine operations.
  - 19. Describe cutting effects on metal.
  
- E. Utilize the machinery's handbook.
  - 20. Understand content within the machinery's handbook.
  - 21. Locate information in the machinery's handbook.
  - 22. Locate tolerances for class of fits utilizing machinery's handbook.
  - 23. Demonstrate knowledge of locating mathematical formulas in the machinery's handbook.

24. Select fasteners for application utilizing machinery's handbook standards.
25. Examine specifications in machinery's handbook needed to machine parts to size.

F. Perform mathematical formulas.

26. Perform mathematical calculations to determine stock needed and stock loss.
27. Identify fits and calculates parts for final machining.
28. Calculate feed and Speeds.
29. Calculate horsepower vs. depth of cut.
30. Calculate cycle times.
31. Describe the importance of cycle times and just in time machining.
32. Describe the importance of speed and feeds.

G. Identify hand tools.

33. Identify hand tool classifications.
34. Select correct sockets and related tools.
35. Select proper screwdrivers.
36. Select hammers for application.
37. Identify snap ring retention tools.
38. Properly select wrenches for application.
39. Correctly select punches and Chisels.
40. Use pry bars correctly.
41. Dress tools for corrective actions.
42. Properly clean and store tools.
43. Maintain tool inventory.
44. Safely use hand tools.

## **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>.