

COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	Bench Work
COURSE NUMBER	MACH 0103
DIVISION	Career and Technical Education
DEPARTMENT	MACH
CIP CODE	48.0501
CREDIT HOURS	1
CONTACT HOURS/WEEK	Class: 1 Lab:
PREREQUISITES	MACH 0105

COURSE DESCRIPTION

This course will introduce layout and bench work procedures that will provide the learner with the principles of locating, analyzing and performing techniques used for machining process to be performed, and the common tools that can be associated with the procedures. It will also cover some repair procedures that may be needed, common to the industry.

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 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 on 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 – NEED OUTLINE

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

- A. Conduct safety inspections.
 - 1. Conduct a job hazard analysis for a machine tool shop.
 - 2. Apply precautions needed to minimize hazards for work with drills and grinders.
 - 3. Apply safety precautions for hand and hydraulic presses.
 - 4. Locate fire extinguishers within work area.
 - 5. Participate in disaster control exercises.

- B. Identify hazards that may be in the workplace.
 - 6. Evaluate P.M. condition of equipment and document daily.
 - 7. Properly store tools and equipment.
- C. Document daily maintenance on equipment.
 - 8. Document daily equipment logs.

- D. Select hand tools for proper use of a given job.
 - 9. Select proper layout dyes, coatings, inks used in layout procedures.
 - 10. Identify and use scoring, scribing, punching tools to create visible lines used in layouts.
 - 11. Demonstrate techniques for laying out parts using semi and precision lay out procedures.

- E. Perform mathematical calculations to determine correct solutions for tasks.
 - 12. Compute layout dimensions.
 - 13. Create a job analysis

- F. Perform grinder procedures and safety.
 - 14. Perform bench grinder maintenance.
 - 15. Inspect and change grinding wheels.

16. Identify common grinding wheel marking used for identification.
17. Properly dress grinder wheels.
18. Demonstrate hand sharpening drill bits.
19. Recondition, sharpen hand punches and chisels.
20. Grind lathe turning tool left and right on ½ tool steel blank.

G. Perform drill press procedures and safety.

21. Identify parts of the drill press (sensitive and radial).
22. Define safety for drilling equipment.
23. Create holes to a specified size using electric, pneumatic hand drills.
24. Maintain PMI data sheet for drill presses.
25. Demonstrate drill press maintenance.
26. Select proper drill press for application.
27. Safely use drill press to perform operations.
28. Identify tool holding methods.
29. Adjust equipment for speed and feeds.
30. Demonstrate work holding devices for the drill press.
31. Apply cutting fluids using distribution methods.
32. Select proper cutting tools for counter boring, counter sink, reaming, drilling and tapping.
33. Demonstrate hole forming procedures listed in 29.
34. Demonstrate proper care for drilling cutters.

H. Perform power sawing equipment and safety.

35. Identify parts of sawing equipment. (vertical, horizontal)
36. Define safety for sawing procedures.
37. Maintain PMI data sheet for sawing equipment.
38. Demonstrate sawing equipment maintenance.
39. Select proper blade for sawing different materials.
40. Adjust equipment for correct speed and Feed.
41. Apply and mix cutting fluids for application. (Refract meter)
42. Cut and weld band saw blades.
43. Install band saw blades, hand and power saws.
44. Stack saw stock to specified size.
45. Demonstrate straight sawing procedures. (vertical and horizontal)
46. Demonstrate circular sawing procedures. (vertical contour)
47. Demonstrate angular sawing procedures. (vertical and horizontal)
48. Perform hand hack sawing procedures.
49. Explain internal sawing procedures.

I. Use hand tools and safety.

50. Identify proper hole size for tapping procedures.
51. Identify proper hole size for reaming procedures.
52. Identify taps and dies.
53. Define proper holding devices for tap and dies.
54. Properly ream and tap holes.
55. Properly thread rod using dies.
56. Identify files and their uses.
57. Demonstrate proper care for files, taps and dies, broaches.
58. Perform hand broaching procedures for creating a keyway.
59. Install heli-coil, rosan thread repair inserts.
60. Demonstrate removing broken or seized fasteners.
61. List practices to perform installation of bearings, pins, bushings with the use of arbor and hydraulic methods.

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>.