COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	Mathematics in Manufacturing
COURSE NUMBER	MACH 0111
DIVISION	Career and Technical Education
DEPARTMENT	MACH
CIP CODE	48.0501
CREDIT HOURS	3
CONTACT HOURS/WEEK	Class: 3 Lab: 0
PREREQUISITES	None

COURSE DESCRIPTION
This course will introduce the learner to the step by step approach to mastering the mathematical skills needed by today's technicians. This course will enable the learner to relate basic math concepts and operations specific to today's 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. Understand the importance of using whole numbers.
   1. Understand the importance of using whole numbers.
   2. Perform the addition of whole numbers.
   3. Perform the subtraction of whole numbers.
   4. Perform the multiplication of whole numbers.
   5. Perform the division of whole numbers.

B. Apply the use of fractions in the shop environment.
   6. Perform the addition of common fractions.
   7. Perform the subtraction of common fractions.
   8. Perform the multiplication of common fractions.
   9. Perform the division of common fractions.
   10. Combine operations with common fractions.

C. Combine operations with the use of decimal fractions
   11. Perform the addition of decimal fractions.
   12. Perform subtraction of decimal fractions.
   13. Perform multiplication of decimal fractions.
   14. Perform division of decimal fractions.
   15. Perform combined operations with decimal fractions.

D. Implement the use of measuring tools
   16. Perform length measuring with instruments.
   17. Perform OD ID measuring with proper devices.
   18. Identify units of measurement.
   19. Measure angularity with proper tools.
   20. Calculate cycle times.

E. Combine the use of measuring formulas.
   21. Compute square measurements

22. Calculate areas of squares and odd shapes.
23. Find areas of forms and odd shapes.
24. Calculate volume of forms and shapes.
25. Calculate of mass (weight) measures.

F. Implement the use of graphs and charts
26. Calculate percents. Computes square measurements.
27. Create graph to recognize time management.

G. Implement the use of ratios and proportions
28. Calculate ratios.
29. Calculate proportions.
30. Calculate indirect proportions.
31. Calculate indirect proportions.

H. Apply Shop formulas
32. Calculate thread formulas.
33. Calculate gear computations.
34. Calculate tapers.
35. Calculate speed and feeds per load vs. horsepower.

I. Implement powers, roots and equations
36 Use powers in formulas.
37. Apply the use or square roots in formulas.
38. Use expressions and equations' to provide solutions to equations.

J. Apply trigonometry formulas in a shop environment
39. Apply right angle trig to solve equations.
40. Calculate sine bar calculations.
41. Measure cord lengths utilizing trig.
42. Calculate cordial segments for key seat depths.
43. Compute angles with measuring disks.
44. Calculate helix angles to find cutter or thread angles.

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.