

COURSE SYLLABUS

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| LAST REVIEW | Fall 2022 |
| COURSE TITLE | Quality Control and Inspection |
| COURSE NUMBER | MACH 0105 |
| DIVISION | Career and Technical Education |
| DEPARTMENT | MACH |
| CIP CODE | 48.0501 |
| CREDIT HOURS | 1 |
| CONTACT HOURS/WEEK | Class: 1 Lab: |
| PREREQUISITES | None |

COURSE DESCRIPTION

This course will introduce Quality Control Procedures that will provide the learner with the principles of locating, analyzing and performing techniques used for precision measurement to be obtained, and the common tools that can be associated with the procedures. The course will also emphasize on the importance of interchangeability.

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

- I. Intro to quality control standards
 - A. Importance of interchangeability
 - B. Determination of proper tools for variety measurements
 - C. Precautions with measuring tools
 - D. Recordkeeping
- II. Precision and non-precision measuring tools
 - A. Proper selection of correct tools used in measuring
 - B. Measuring parts by using various methods
 - C. Calculation of measurements
 - D. Classification of specialized measuring tools
 - E. Measuring tool accuracy
 - F. Calibration of precision tools
 - G. Storing and care of measuring tools
- III. Intro to tolerances
 - A. Identifying part deviations
 - B. Locating information on blue prints
 - C. Locating information for standards
 - D. Calculations to determine size, shapes and tolerance
- IV. Surface finishes
 - A. Introduction to surface conditions
 - B. Tools and comparators used to define surface conditions
 - C. Hardness scales
 - D. Hardening conditions
 - E. Electro plated surface finishes
 - F. Painted surface finishes

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

- A. Document measurement information for QC
 1. Record measurements and plot using CMM.
 2. Define interchangeability.
 3. Define statistical process control. (SPC)

4. Locate examples of sliding, running, thread classes, within the machinery's handbook.
 5. Explain the importance of 1st piece off inspection.
 6. Calibrate measuring tools using standards and or gage blocks.
 7. Document and record the calibration of measuring tools.
- B. Select correct measuring tool for procedure
8. Identify graduations and measure parts with scales and tapes.
 9. Measure and or layout parts with various spring type measuring devices.
 10. Describe the parts of the combination square and all its uses.
 11. Demonstrate the use of the OD and ID micrometers.
 12. Demonstrate the use of blade type calipers.
 13. Demonstrate the use of depth type measuring devices.
 14. Demonstrate the use of special purpose micrometers and measuring scales.
 15. Demonstrate the use of protractors with and without a Veneer scale.
 16. Inspect and explain the uses for ring, telescoping, plug/pin, taper, snap, small hole, radius, GO/NOGO types of gages.
 17. Perform measuring with the use of dial indicators.
 18. Perform set-ups with the use of dial indicators.
 19. Perform measurements utilizing height gage and surface plate.
 20. Measure threads (TPI) with screw pitch gage.
 21. Set-up and perform production measuring on CMM.
 22. Describe SPC and when it's used.
 23. Set-up and measure parts with optical comparator.
 24. Inspect surface finishes using surface roughness gage.
 25. Properly clean and store measuring tools.
- C. Perform mathematical calculations to determine correct solutions for tasks
26. Calculate 3 wire size and measurement over wires.
 27. Calculate maximum and minimum deviation from measurements.
 28. Locate tolerances for class of fits utilizing machinery's handbook,
 29. Calculate sine bar angles and block heights.
 30. Describe stack tolerance and conditions related to outcomes.

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>.