MACH A100: INTRODUCTION TO MACHINE SHOP

Item	Value
Curriculum Committee Approval Date	04/12/2023
Top Code	095630 - Machining and Machine Tools
Units	3 Total Units
Hours	90 Total Hours (Lecture Hours 36; Lab Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

A basic course in machine shop practices. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Properly define and describe common hand tools and measuring tools used in a machine shop.
2. Correctly measure machine parts with precision and non- precision tools.
3. Perform basic set ups on both milling machines and engine lathes.

Course Objectives

- 1. Demonstrate proper safety precautions in the machine shop.
- 2. Use common non-precision and precision measuring tools found in the machine shop.
- 3. Develop skill in grinding lathe tool bits and be able to discuss the various tool angles.
- 4. Make cutting speed calculations.
- 5. Apply proper feed rates to various metal cutting situations.
- 6. Practice the accurate use of common cutting tools.
- 7. Identify the correct cutting tool for the basic operation to be performed.
- 8. Define and describe the use of the common hand tools used in the machine shop.
- 9. Define and describe the main components of the band saw, drill press, surface grinder, lathe and milling machine.
- 10. Describe machining characteristics of the common metals used in local machine shops.

Lecture Content

Orientation Course requirements, grading procedures, shop procedures, etc. Machine shops and job opportunities Tour of shop facilities Shop Safety General safety rules Clothing and materials handling safety Machine tool operation safety Layout Tools, Hand Tools, and Bench Work Proper use and handling of layout and bench tools Hand tools: files, hacksaws, wrenches, chisels, tap, and dies Layout procedures: reading scales, combination set use Bench operations Precision Measurement Fractions and decimal inch conversions Micrometers Vernier calipers Band Saws Cut-off and vertical Operations safety procedures Job setup Blade speed setting Materials handling and gage setting Blades, kinds, welding procedures, installing, and removing Operating procedures Drilling Machines Kinds and sizes, parts, and functions Operational safety procedures Drills and other cutting tools and cutter holding devices Job setup and work holding devices Speed and feeds Operating procedures Surfacing Grinding Kinds, basic parts, and functions Operational safety procedures Grinding wheel care and dressing procedures Job setup Operating procedures Milling Machines Operational safety procedures Job setup and work holding devices Operating procedures, end milling, drilling, reaming Metals Classification systems Tool geometry Special machining characteristics Cutting oils

Lab Content

See Course Content.

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- Lab (04)
- DE Live Online Lab (04S)

Instructional Techniques

Lecture and lab activity on basic machine tools. Instructor feedback.

Reading Assignments

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Writing Assignments

Students must show writing proficiency in quizzes, inspection reports, homework assignment, mid-term and final exams.

Out-of-class Assignments

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Demonstration of Critical Thinking

Quizzes, final exams are 40%, laboratory work shall count as 60% of final grade.

Required Writing, Problem Solving, Skills Demonstration

Students must show writing proficiency in quizzes, inspection reports, homework assignment, mid-term and final exams.

Textbooks Resources

1. Required Hoffman, Edward G.G.. Shop Reference Handbook, latest ed. Chicago: Industrial Press Inc, 2000 Rationale: - 2. Required Kibbe, Richard. Machine Tool Practices, ed. Atlanta: Prentice Hall, 2006 Rationale: -

Other Resources

1. Students required to supply basic measuring tools and safety goggles.