MACH A121: COMPUTATIONS FOR MACHINISTS

Item	Value
Curriculum Committee Approval Date	12/02/2020
Top Code	095630 - Machining and Machine Tools
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S)
Associate Arts Local General Education (GE)	• Area 1B Communication and Analytical Thinking (OA2)
Associate Science Local General Education (GE)	• Area 1B Communication and Analytical Thinking (OAS2) • Area 2 Mathematical Concepts and Quantitative Reasoning (OMTH)

Course Description

A course in applied technical computations for students in machine technology and CNC studies. Topics include basic computations, shop formulas and equations, and applied trigonometry as used in the machining industries. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Demonstrate proper use of TI 136, or similar calculator to perform basic calculations of addition, subtraction, multiplication and division.
2. Calculate right triangle solutions to basic machining operations.
3. Construct basic plane geometry figures using basic drawing tools:rulers, 30/60 triangles, 45 degree triangles, compasses and protractors.
4. Manipulate algebraic formulas and equations common to shop problems.

Course Objectives

- 1. Demonstrate basic G codes for CNC machines.
- 2. Demonstrate basic M codes for CNC machines.
- 3. Demonstrate geometry of cutter paths for CNC milling machine work.
- 4. Demonstrate geometry of cutter paths for CNC lathes.
- 5. Demonstrate application of plane geometry to CNC tool motions.
- 6. Demonstrate use of the scientific calculator to perform trig functions.
- 7. Demonstrate trigonometry of the right triangles.
- 8. Demonstrate trigonometry of the oblique triangle.
- 9. Demonstrate basic shop formulas and their mathematical operations.

Lecture Content

Introduction Introduction to course Grading system Required materials Basic Computations and Calculations Addition subtraction Multiplication and division Fractions and decimals Percent Scientific calculator Applied Formulas and Equations What is an equation? What is a formula? Signed numbers Scientific and engineering notation Variables and constants Basic equations Order of operations Areas and volumes Formulas in machine tech Shop Geometry Points and lines Arcs and circles Planes Geometric theorems constructions Cylinders, cones, and spheres Applied Trigonometry Right triangles Pythagorean theorem Trig functions; sine, cosine, and tangent Scientific calculator and trig tables Oblique triangles Law of sines Law of cosines CNC Problems and Calculations Cutter path computations for lathes Cutter path computations for milling machines Cutter path compensation and calculations

Method(s) of Instruction

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

Instructional Techniques

Instruction is through lecture and examples of work problems by the instructor with weekly homework assignments.

Reading Assignments

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Writing Assignments

Writing proficiency is demonstrated by the reading assignments in the textbook. Homework reading assignments and work problems will be assigned at each class meeting.

Out-of-class Assignments

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Demonstration of Critical Thinking

There will be a written mid-term and final exam and a series of short quizzes throughout the course.

Required Writing, Problem Solving, Skills Demonstration

Writing proficiency is demonstrated by the reading assignments in the textbook. Homework reading assignments and work problems will be assigned at each class meeting.

Textbooks Resources

1. Required Smith, Robert D.. Mathematics for Machine Technology, 5th ed. New York: Delmar Publications, 0 Rationale: -