

MACH 51A Course Outline as of Fall 2019**CATALOG INFORMATION**

Dept and Nbr: MACH 51A Title: BEG MACHINE TOOL TECH

Full Title: Beginning Machine Tool Technology

Last Reviewed: 2/28/2022

Units	Course Hours per Week		Nbr of Weeks		Course Hours Total	
Maximum	2.00	Lecture Scheduled	1.00	17.5	Lecture Scheduled	17.50
Minimum	2.00	Lab Scheduled	3.00	8	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 35.00

Total Student Learning Hours: 105.00

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

Introduction to theory and practices of machining processes. Includes use and care of the lathe, mill, drill press, common hand tools, and the measurement and layout of metal for producing a machine part to print specifications. Also recommended for students in related vocational areas.

Prerequisites/Corequisites:**Recommended Preparation:**

Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:**Schedule of Classes Information:**

Description: Introduction to theory and practices of machining processes. Includes use and care of the lathe, mill, drill press, common hand tools, and the measurement and layout of metal for producing a machine part to print specifications. Also recommended for students in related vocational areas. (Grade Only)

Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 100 or ESL 100

each relative to producing parts on manually operated machines.
17. Identify realistic career objectives in machine tool technology.

Topics and Scope:

- I. History of Machine Tooling
 - A. Development of technologies
 - B. Development of power sources
- II. Machine Tool Theory
 - A. Common manufacturing materials and processes
 - B. Properties of metals
- III. Shop Safety
 - A. Practices
 - B. Equipment
 - C. Professionalism
- IV. Grinding
 - A. Tool bit grinding procedures and clearances
 - B. Calculating and setting angles
 - C. Pedestal grinder
 - 1. care
 - 2. safety
 - 3. set-up
 - 4. use
- V. Lathes/Turning Machines
 - A. Use
 - B. Safety
 - C. Set-ups
 - D. Parts and functions
 - E. Types of machines
- VI. Blueprint Reading and Interpretation
- VII. Metrology/Dimensional Measurement
 - A. Types of measuring instruments
 - B. Scales and rules
 - C. Micrometer
 - D. Height gage and vernier-scale
- VIII. Milling Machines
 - A. Vertical mills
 - B. Horizontal mills
 - C. Components, controls, and functions
 - D. Care
 - E. Safety
 - F. Tooling operations
 - G. Set-up
 - H. Feeds
 - I. Speeds
 - J. RPM
- IX. Drill Presses
 - A. Types
 - B. Care
 - C. Safety
 - D. Uses
 - E. Drill speeds

- F. Feeds
- G. RPM
- H. Drill bits
 - 1. sharpening
 - 2. nomenclature
- X. Saws
 - A. Types
 - B Care
 - C. Safety
 - D. Set-up
 - E. Uses
- XI. Hand Tools
 - A. File types
 - B. Hammers
 - C. Hacksaws
 - D. Safety
 - E. Vises
- XII. Careers in Machine Tool Technology
 - A. Career options
 - B. Workplace ethics
 - C. Professionalism

All topics are covered in the lecture and lab portions of the course.

Assignment:

Lecture-related Assignments

1. Reading from assigned text, approximately 15 pages/week
2. Weekly quizzes based on reading (8 - 16)
3. Final written and performance exams

Lab-related Assignments:

1. Lab projects related to creating hand and machine tool components.
Projects will be graded for skill demonstration and problem solving and may include:
 - a. on a lathe, produce a hand tool by manufacturing parts & components
 - b. set up a mill and mill a metal plate from a blueprint
 - c. grind a tool bit, calculating and setting appropriate angles
2. Compile a lab notebook of course notes, handouts, process plans and inspection sheets
3. Organize workspace and clean-up lab area

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Compile a lab notebook

Writing 10 - 20%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Lab projects

Problem solving
20 - 30%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Lab projects

Skill Demonstrations
20 - 30%

Exams: All forms of formal testing, other than skill performance exams.

Weekly quizzes based on reading

Exams
20 - 30%

Other: Includes any assessment tools that do not logically fit into the above categories.

Professionalism, attendance, organization, and clean-up

Other Category
20 - 30%

Representative Textbooks and Materials:

Precision Machining Technology. 2nd ed. Hoffman, Peter and Hopewell, Eric and Janes, Brian. 2015

Instructor prepared materials.