

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

CADD TECHNOLOGY 141 – INTRODUCTION TO TECHNOLOGY OF MACHINE TOOLS

2 hours lecture, 2 units

Catalog Description

This course introduces new manufacturing technologies and processes. Study of the development of tools throughout history. Covers the standard types of machine tools used in industry as well as the newly developed space-age machines and processes.

Prerequisite

None

Course Content

- 1) Common Machine Tools (cutting or forming machines)
 - a. Chip-producing machines
 - b. Non-chip-producing machines
 - c. New-generation machines
 - d. Multi-tasking machines
- 2) Standard Machine Tools
 - a. Drill press
 - b. Lathe
 - c. Milling Machine
- 3) Computer Numerical Control Machines (CNC)

Course Objectives

Students will be able to:

- 1) Explain how various machine tool performs on workpieces.
- 2) Describe why machine tools are so important to our society.
- 3) How to use various types of measuring instruments.
- 4) Explain the use and application of gauge blocks.
- 5) Identify and explain the surface finishing processes.
- 6) Describe elements of high-speed steel cutting tools.
- 7) List the advantages of coated carbide cutting tools over conventional carbide cutting tools.
- 8) Explain characteristics of a good cutting fluid.
- 9) State the main uses of a vertical milling machine.

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in the subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Midterm and final exams that measure the student's ability to describe the applications of various types of machining tools as well as describe the applications of standard machine tools and numerical control (NC) of machining tools.
- 2) In-class activities (written/oral) that measure the student's ability to articulate the various types of measuring instruments as well as the application of gauge blocks and characteristics of cutting fluid.

Special Materials Required of Student

None

Minimum Instructional Facilities

CADD computer lab

Method of Instruction

Lecture demonstration

Out-of-Class Assignments

Weekly group mini projects

Texts and References

- 1) Required (representative example): Steven Krar, Arthur Gill and Peter Smid. Technology of Machine Tools, Publisher: McGraw-Hill, 9th ed., 2024. ISBN: 13 978-0-07-3511083-5
- 2) Supplemental: Weekly handouts

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- 1) Recognize safe and unsafe work practices in a shop.
- 2) Plan the sequence of operations and machine round work mounted in a lathe.
- 3) Measure the size of a variety of objects to within .001-inch (0.01-mm) accuracy.
- 4) Measure to within .0005-inch (0.01-mm) accuracy with a dial indicator, mechanical and optical comparator, or electronic gages.
- 5) Explain the operation of a laser interferometer.
- 6) Identify the applications of various types of cutting-tool material.