MACH A200: TOOLING

Item	Value
Curriculum Committee Approval Date	10/06/2021
Top Code	095630 - Machining and Machine Tools
Units	2.5 Total Units
Hours	81 Total Hours (Lecture Hours 27; 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 the making of jigs, fixtures, and molds. ADVISORY: MACH A100, MACH A105, MACH A110, and MACH A120. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Demonstrate knowledge of fits and allowances for common tooling components.
2. Demonstrate the appropriate selection of tools for project planning.

Course Objectives

- 1. Pass a tool making safety test.
- 2. Recognize the economics of tooling costs
- 3. Discuss the different types of tooling.
- 4. Relate the important characteristics of tool steels.
- 5. Calculate fits and allowances for common tooling components.
- 6. Create at least one running fit.
- 7. Select the appropriate tools in project planning.
- 8. Locate and select common off the shelf tooling components.

Lecture Content

Course orientation Grading practices Course overview Shop tour Safety Introduction to tooling Definition of tooling Types of tooling 10 to 1 ratio for tooling accuracy EDM applications for tooling Wire feed Sinker Fits Press fits Slip fits Running fits Fit vs finish and hardness Fixtures Fixture design criteria Part locating Stops Multiple part fixtures Over the counter components Dies Stamping dies Trimming dies Forming dies Heading dies Extruding dies Molds Types of plastic injection molds Key features and components of molds Finishing operations Heat treating Plating Grinding and polishing

Lab Content

General shop safety Work Holding Devices for mills and lathes Tool Set Up for mills and lathes Cutting Tool Material and Geometry for mills and lathes Speeds and Feeds for mills and lathes Facing and turning Turning Tapers Grooving and Cut off Knurling Filing and Polishing Drilling Reaming, Boring, Tapping Threading Milling operations Surface Grinding Cut off Sawing Off Hand Grinding

Method(s) of Instruction

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

Instructional Techniques

Lecture, demonstration, and lab activity on a variety of machines

Reading Assignments

Students will be given handouts as study guides. Approximately 1 hour per week.

Writing Assignments

Students will write short answers, quizzes and exams; some exams may be practical. Maintaining a notebook of class assignments and activities Approximately a 1 hour per week.

Out-of-class Assignments

Students will refer to notes and handouts in preparation for running the parts on the machine. Once the parts are complete student will fill out inspection reports to record their accuratcy of machinng. Approximately 1 hour per week.

Demonstration of Critical Thinking

Quizzes, final exam, laboratory activity making simple tooling

Required Writing, Problem Solving, Skills Demonstration

Students will write short answers quizzes and exams: some exams may be practical exercises

Eligible Disciplines

Machine tool technology (tool and die making): Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience.

Other Resources

1. Handouts to be provided and distributed by the instructor.