

# Tech/ME41 Machine Shop Safety and Fundamentals

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San Jose State University / College of Engineering  
Aviation and Technology Department                      Mechanical & Aerospace Engineering Department

## Faculty Information

Course Instructor: Douglas Muntz

Phone: (408) 410-5449

Office Hours: Monday 1:00 to 3:00 IS 119/122

Class times    Monday 3:00 to 5:45 and 6:00 to 8:45

                    Wednesdays 3:00 to 5:45

Office:

email: douglas.muntz@sjsu.edu

## Description

Introduction to basic machine shop safety and skills. Fabrication of mechanical components and assemblies from engineering drawings, performing tolerance inspection and developing fabrication process plans.

**Prerequisites:** ME 20, Tech 20, CE 20 (or equivalent)

**Units:** 1 unit, laboratory

**Required Materials:** (Have the following by the second class meeting. Graded!)

1. Safety goggles/safety glasses
2. Digital or Dial Calipers (6"- 8")
3. Combination Square 12 inch
4. 3 ring binder/notebook with blank paper (hardback preferred)
5. Text book *:Machine tool practices*, (8th ed.) by Kibbe, R. R., Neely, J. E., Meyer, R. O., & White, W. T. (2006). Prentice Hall: NJ. \*\*\*\*

## Course Goals

1. To develop keen awareness of hazards, risks, and safe practices in a machine shop environment. To be able to recognize and alleviate unsafe situations.
2. To acquire hands on experience with fabrication of mechanical components and assemblies.
3. To achieve reasonable proficiency with basic operations using common Machine tools.
4. To enhance knowledge about the interdependence among design manufacturing, and inspection.

## Student Learning Objectives

Students who complete this course successfully will be able to:

1. Identify hazards associated with specific machine tools and processes, and ways of preventing risk of injury.
2. Independently and safely operate common sheet metal tools including a shear, press brake, punch, notcher, and spot welder.
3. Select appropriate tooling, fixturing, and operating parameters for common machining operations including sawing, drilling, turning, and milling.

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4. Independently and safely operate common machining tools including a band saw, drill press, lathe, and vertical mill.
5. Explain and describe engineering fabrication drawings and perform appropriate inspection with common metrology tools including calipers, micrometers, dial indicators, and other gages.

## Graded Work

Prior to working in the course, each student is required to take a general laboratory safety test and pass it at the 100% performance level.\*

The student will undertake a series of laboratory projects which will be evaluated for their course evaluation. These projects include a sheet metal project and a machining project. For each project, detailed hand drawings, (for “C” students) or detailed CAD drawings for fabrication, and process planning details will be submitted. Projects will be evaluated for accuracy and detail of planning, and for the quality of execution.

Lab performance will be based on laboratory habits: neatness, maintenance of a clean workstation, and conduct of lab maintenance tasks assigned by the instructor. Grading is done as follows:

5%	Required materials	Due Jan. 3+5
⇒ 10%	Sheet Metal Sample drawing	Due March 3+5
⇒ 10%	Sheet Metal Sample	Due March 3+5
⇒ 10%	Drawing for Sheet Metal Project (tote box)	Due March 17+19
⇒ 10%	Sheet Metal Project w/student designed handle	Due March 17+19
⇒ 10%	Lathe Sample	Due April 21+23
⇒ 10%	Lathe Sample Drawing	Due April 21+23
⇒ 10%	Mill Sample	Due May 5 +7
⇒ 10%	Mill Sample Drawing	Due May 5+7
⇒ 5%	Machine tool assembly	Due May 12 +14
10%	Safety awareness	Due Everyday

\*Students will not receive credit for course unless the general lab safety quiz is passed within two tries or less.

Credit in the class is earned by earning an average score of 70% on all assignments.

## Shop Clean-up

A clean shop is a safe shop. The last 10 to 15 minutes of each class will be reserved for shop clean-up. It is the students job and responsibility to clean their area and check with instructor before leaving.

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## Schedule of Activities

<b>Week</b>	<b>Activity</b>
Week 1:	Safety Orientation, Tool ID , Shop tour, General safety hand-out
Week 2:	Sawing, drilling, tapping, filing, polishing, General Safety test
Week 3:	Sheet Metal machine demo/safety. Sheet metal safety test
Week 4:	Sheet metal Sample Drawing and Demo
Week 5:	Sheet metal Tote Drawing and Demo
Week 6:	Lab work
Week 7:	Lathe info and warm-up (plumb bob)
Week 8:	Lathe operation, Mill safety and test
Week 9:	Lathe Sample Demo
Week 10:	Introduction to milling and Mill Sample demo
Week 11:	Finish Mill Sample demo
Week 12:	Lab work
Week 13:	Lab work
Week 14:	Last day to use the lab
Week 15:	Shop clean up (last class)
Note :	No Final during finals

## Academic Integrity Standards and Policies

Academic honesty is expected without question in this course. Students who are found to have submitted materials that do not adhere to SJSU standards of academic integrity will suffer the following two consequences:

- A grade of zero [0] will be given for the assignment in question; and
- A report of the incident will be filed with the university. This report may stay on your permanent collegiate record.
- You may also be subject to further disciplinary action being taken by the university.

For the SJSU policy on Academic Integrity, refer to:

<http://www.sjsu.edu/senate/F06-2.pdf>

**a) Academic integrity statement** (from the Office of Student Conduct and Ethical Development):  
“Your own commitment to learning, as evidenced by your enrollment at San José State University, and the University’s Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Student Conduct and Ethical Development. The policy on academic integrity can be found at [http://sa.sjsu.edu/student\\_conduct](http://sa.sjsu.edu/student_conduct).

**b) Campus policy in compliance with the Americans with Disabilities Act:**

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“If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with DRC to establish a record of their disability.”

**More about Cheating.** At SJSU, cheating is the act of obtaining or attempting to obtain credit for academic work through the use of any dishonest, deceptive, or fraudulent means. Cheating at SJSU includes but is not limited to:

Copying in part or in whole, from another’s test or other evaluation instrument;  
Submitting work previously graded in another course unless this has been approved by the course instructor or by departmental policy. Submitting work simultaneously presented in two courses, unless this has been approved by both course instructors or by departmental policy. Altering or interfering with grading or grading instructions; Sitting for an examination by a surrogate, or as a surrogate; any other act committed by a student in the course of his or her academic work which defrauds or misrepresents, including aiding or abetting in any of the actions defined above.

**More about Plagiarism.** At SJSU plagiarism is the act of representing the work of another as one’s own (without giving appropriate credit) regardless of how that work was obtained, and submitting it to fulfill academic requirements.

Plagiarism at SJSU includes but is not limited to the act of incorporating the ideas, words, sentences, paragraphs, or parts thereof, or the specific substances of another’s work, without giving appropriate credit, and representing the product as one’s own work; and representing another’s artistic/scholarly works such as musical compositions, computer programs, photographs, painting, drawing, sculptures, or similar works as one’s own.

## Students With Disabilities

Campus policy. In compliance with the Americans with Disabilities Act:

*“If you need course adaptations or accommodations because of a Disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities register with DRC to establish a record of disability.”*

## Cell Phones

Students will turn their cell phones off or put them on vibrate mode while in class. They will not answer their phones in class. Students whose phones are disrupting the education process will be dealt with by: \_\_\_\_\_

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## Computer Use

In the classroom, you may use computers only for class-related activities such as taking notes on the lecture underway, following the lecture on Web-based Power Point slides that the instructor has posted, and finding Web sites to which the instructor directs students at the time of the lecture. Students who use their computers for other activities or who abuse equipment in any way, at a minimum, will be asked to leave the class and lose participation points for the day, and may be referred to the Judicial Affairs Officer of the University for prohibited uses of campus computers (Such referral can lead to suspension from the University). Students are urged to report to their instructors computer use that they regard as inappropriate (i.e., used for activities that are offensive or not class related).

## Attendance

Attendance will not be taken at the start of each class, but a check-out/clean-up/tool check will be performed at the end of each class or when you leave. If you miss a class you are responsible for any material discussed or assignments given. A large portion of class will be used for problem solving in small groups. All students are expected to participate in class discussions and problem solving. Students who are often absent will find themselves at a disadvantage during the tests. If you miss a lab session you will get a zero on the lab portion of the course.

**Safety Violations** ( by you or people around you) a **grade lower** for each violation. (Ouch!)

Possibility of making this up by: \_\_\_\_\_