

ME 350 Syllabus - Fall 2023

Lecture:

W 10:00 am – 11:00 am, Room: ETC 5.132

Laboratory:

TTh 9:00am – 12:00 pm or TTh 1:00 pm – 4:00 pm, ETC 1.210

Instructor:

Prof. Michael Cullinan

Office: ETC 4.154

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Email: Michael.Cullinan@austin.utexas.edu

Office Hours:

Mon/Wed: 3:30-4:30pm

Text:

Kalpakjain, Serope and Steven Schmid, Manufacturing Engineering and Technology, 7th Edition

Course Summery and Objectives:

The objective of this course is to help develop the engineering student's understanding of the capabilities and limitations of machine tools commonly used in prototyping and manufacturing. Students will acquire personal experience operating equipment to gain knowledge of the parameters and limitations for production needs in industry. Students will gain exposure to geometric dimensioning and tolerancing, learn the terminology used in the manufacturing environment to communicate effectively, and become proficient in writing programs for Computer Numerical Control (CNC) Machinery.

Grading:

- Take-Home Final Exam: 15%
- In class exercises and quizzes: 10%
- Lab Projects: 60% (Practice Parts – 10%, Vise – 30%, CNC Part – 20%)
- Homework: 15%

Examinations:

There will be one take-home final exam. The exam will be distributed on the last day of classes and will be due during the normal exam period for the class.

Homework:

All homework must be submitted in class on the due date. Students may collaborate on homework assignments but must clearly indicate who they worked with at the top of each

submitted assignment. However, any evidence of plagiarism or other forms of scholastic dishonesty will not be tolerated.

Special Notes:

Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259, <http://www.utexas.edu/diversity/ddce/ssd/>

Lab Projects:

The lab portion of this course will consist of four laboratory projects. The first project will be to fabricate a set of practice parts on the manual lathe and mill. Workbooks and instructions for these a parts will be distributed to the class. After the practice parts are turned in, students will be given materials and lab manuals for the machining of a mechanical vice. In the vise project, students will machine rough-cut steel and brass parts into a working vise using band saws, vertical mills, engine lathes, pedestal and surface grinders, surface plates, height gauges, and the optical comparator. For the CNC project, students will design a part in solidworks and then use MasterCam to create a CNC program for machining the part. Machining time on the CNC is limited and must be scheduled with one of the instructors in advance. For the casting project, students will be provided with a 3" cube of extruded foam that the student will be required to cut into a decorative or functional pattern for lost foam casting. The design must allow room for attaching a 1" square sprue on one of the faces and must have sufficient strength to withstand compaction in the sand mold without deformation.

Course Schedule:

Date	Topic	Reading	Homework	Project Milestones
8/23	Intro and Safety			
8/30	Machine Tool Basics - Lathes	Chapter 23		
9/6	Machine Tool Basics – Mills	Chapter 24	HW #1 Due	
9/13	CNC Machining			Practice Parts Due
9/20	CAD/CAM Software		HW #2 Due	
9/27	Chip Formation, Calculating Feeds and Speeds	Chapter 21		
10/4	Geometric Dimensioning and Tolerancing	Chapter 35	HW #3 Due	
10/11	Work holding and Inspection	Chapter 36		
10/18	Manufacturing Systems		HW #4 Due	
10/25	Manufacturing Systems II	Chapter 30		
11/1	Casting	Chapters 10 and 11	HW #5 Due	

11/8	Advanced Manufacturing Processes – Micro and Nanomanufacturing	Chapter 29		
11/15	Project Time			
11/22	No Class - Thanksgiving			
11/29	Advanced Manufacturing Processes – Additive Manufacturing		Take-Home Final Distributed	Vise and CNC Projects Due