

ME 363
Principles and Practice of Manufacturing Processes
Fall 2021
Purdue University, West Lafayette IN, USA

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Here are ways to get information about changes in this course.

Instructors: Prof. Yung C. Shin, MEG082 email: shin@purdue.edu
Lectures: 10:30am-11:20am on Tuesdays and Thursdays
<https://purdue.webex.com/meet/shin>
Office hours: 11:00am-noon on Mondays and Wednesdays
<https://purdue.webex.com/meet/shin>

Prof. Benxin Wu, MEG091 email: wu65@purdue.edu
Lectures: 1:30pm-2:20pm on Tuesdays and Thursdays
<https://purdue-edu.zoom.us/j/99853821231>
Meeting ID: 998 5382 1231
Office hours: 2:30pm-3:20pm on Tuesdays and Thursdays
<https://purdue-edu.zoom.us/j/96106719912>
Meeting ID: 961 0671 9912

Course Website: <https://engineering.purdue.edu/ME363/>

Teaching Assistants: Vaidyanath Harinarayana, vharinar@purdue.edu
Christopher Morrissey, morriss9@purdue.edu
Weidong Liu, liu2568@purdue.edu

Technical Services Managers:

Student Maker Spaces Senior Manager: Darrin Wilcoxson
PERL: Michael Sherwood, 4-5651

Student Machine Shop Supervisor:

John Wheeler, Student Shop, 4-5851

Required Text: Manufacturing Engineering and Technology, by Serope Kalpakjian and Steven Schmid, Prentice Hall, 6th edition, 2009.

Suggested References:

1. Materials and Processes in Manufacturing, by E. P. DeGarmo, J.T. Black and R.A. Kohser, 9th edition, John Wiley & Sons, Inc., 2003.
2. Fundamentals of Modern Manufacturing, by M.P. Groover, 3rd edition, John Wiley & Sons, Inc.,

2007.

3. Manufacturing Processes and Equipment, by George Tlusty, Prentice Hall, 2000.
4. Other course handouts.

Grading Policy

Exam #1	25%
Exam #2	25%
Laboratory	35%
Projects and Homework	15%
<hr/>	
Total	100%

Some lab assignments will be performed in groups as assigned for the semester, while some labs require individual work. All labs with engineering experiments will require a formal lab report. In addition, you will have an opportunity to grade your lab partners. All reports are due in the lab the following week. No late lab report will be accepted.

Lab Attendance and Report

Attendance of all the labs is required. There will be no make-up labs except for the cases of University approved reasons. In such a case, the student must contact the TA and instructor in advance to attend an alternate lab. All lab reports must be submitted in the beginning of the following lab. Late lab reports will be assessed a penalty. Missing a lab or a lab report will result in an incompleteness grade.

Regrading Policy

Any regrading request for the lab report and homework must be submitted within 48 hours after the graded lab report or homework is returned. The reasons for the regrading must be stated in a written form and attached to the report or homework. Regrading can result in an increase or a decrease or no change in the score.

Safety Policy

Safety is of primary concern in the laboratory. All students must have safety glasses with side shields which must be worn at all times. Shoes or boots (preferably with a steel toe) must be worn. Long hair must be tied back and loose clothing is not permitted. All jewelry must be removed. Failure to adhere to these safety procedures will not allow participating and a grade of zero will be issued for the lab.

The instructor reserves the right to make supplement or other changes to the contents and policies of this class (including its lab sessions) and the class syllabus.

Other Important Notices

- Homework submission: Each homework assignment (hardcopy) will be given to the student in the student's corresponding lab session by the lab TA. The completed homework will be collected from the student by the same TA at the beginning of the lab session one week later.
- If a homework is submitted late, its grade will be reduced by 1/3 of the homework's full points per day late, unless under a university-approved reason. If a late submitted homework is lost for any reason, the student will be fully responsible for any consequence.
- Homework, project, lab and exam grades will be posted in Brightspace, and students should regularly check the grades to make sure they are correct, and have to report any problem found within 1 week of the grade posting date, and also before the date of the final exam (students will be fully responsible for problems not reported in time).
- The virtual attendance of the class lecture session is required. A student will not lose any point if 2 (or less) lecture classes are missed. However, starting from the 3rd missed class, the student will lose 1% of the class total grade for every class missed unless under a university-approved reason. The video of each lecture may or may not be posted in Brightspace.
- All the documents and materials given to the students in any way (electronically or through hard copies or any other approach) during this class are only for the teaching and learning purpose within this class. The students are not permitted to use any part of the documents or materials for any other purpose. The students are not permitted to distribute or reproduce any part of the documents or materials in any way.

Academic Dishonesty

https://www.purdue.edu/odos/osrr/resources/documents/responding_to_academic_dishonesty.html

DEFINITION OF ACADEMIC DISHONESTY

Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty" (*Section B.2.a of the Student Regulations*). Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of ghostwritten papers, the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest" (University Senate Document 72-18, December 15, 1972).

ACADEMIC INTEGRITY

"Purdue University values intellectual integrity and the highest standards of academic conduct. To be prepared to meet societal needs as leaders and role models, students must be educated in an ethical learning environment that promotes a high standard of honor in scholastic work.

Academic dishonesty undermines institutional integrity and threatens the academic fabric of Purdue University. Dishonesty is not an acceptable avenue to success. It diminishes the quality of a Purdue education which is valued because of Purdue's high academic standards" (S. Akers, *Academic Integrity, A Guide for Students*, 1995, revised 1999).

SyllabusPeriodsMaterialReading

1-5	Introduction, materials, metrology - introduction - metrology - quality and process capability - properties of materials	Introduction Ch. 35 Ch. 36 Ch. 2
6-8	Mechanics of cutting - chip formation - forces, stresses and power	Ch. 21
9-10	Cutting tools - machinability, tool life and wear - economics of machining - geometry and materials	Ch. 22, 25.8
10-11	Machining processes - turning, boring - milling and grinding - high speed machining	Ch. 23,24,25,26
12-14	CNC machining	Ch. 37
15	Exam #1	
16-19	Advanced manufacturing processes - nontraditional machining processes - new and advanced manufacturing processes - laser-based processes	Ch. 25.7,26.6,27
20-22	Micro/nano processes - microfabrication - soft lithography	Handouts Ch. 28,29
23-26	Forming Processes - forging - rolling - extrusion and drawing - sheet metal forming - rapid prototyping and additive manufacturing	Ch. 14 Ch. 13 Ch. 15 Ch. 16 Ch. 20
27-28	- powder metallurgy of metals and ceramics	Ch. 17

29-30 - fabrication of plastics, and composites
- ceramics

Ch. 19
Ch. 18

Laboratory Schedule and Grading

Section 1 (Weidong Liu): Wednesday 8:30-11:20am

Section 2 (Chris Morrissey): Wednesday 2:30-5:20pm

Section 3 (Vaidyanath Harinarayana): Tuesday 11:30-2:20pm

Section 4 (Weidong Liu): Tuesday 8:30-11:20am

Section 5 (Vaidyanath Harinarayana): Wednesday 11:30-2:20pm

Section 6 (Chris Morrissey): Tuesday 2:30-5:20pm

<i>Week (Week of)</i>	<i>Topic</i>	<i>Room</i>	<i>Points</i>
1 Aug. 23	Orientation	ME1178 and student shop	
2 Aug. 30	Metrology	ME1178	50
3 Sept. 6	Metrology	ME1178	50
4 Sept. 13	Machining I	student shop	50
5 Sept. 20	Machining I	student shop	50
6 Sept. 27	Machining II	student shop	50
7 Oct. 4	Machining II	student shop	50
8 Oct. 11	No lab (October break)		
9 Oct. 18	CNC machining (tutorial)	ME 2028 and student shop	50
10 Oct. 25	CNC machining	ME 2028 and student shop	50
11 Nov. 1	CNC machining	ME 2028 and student shop	50
12 Nov. 8	Microfabrication + 3D Printing	ME1030F	100
13 Nov. 15	Microfabrication	MEG028	
14 Nov. 22	No lab (Thanksgiving Week)		
15 Nov. 29	3D Printing	ME1191	100
16 Dec. 6	Final Lab report	MEG028	