

ME 363
Principles and Practice of Manufacturing Processes
Fall 2020
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.

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Teaching Assistants: Bin Zhang, Phone: 765 479 5743, zhan1881@purdue.edu
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Technical Services Managers:

Student Machine Shop: Stephen Florence
PERL: Michael Sherwood, 4-5651

Student Machine Shop Supervisor:

Adam W. Krichbaum, Student Shop, 4-5655

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%
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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.

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.

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	Ch. 25.7,26.6, 27
20-22	Micro/nano processes - microfabrication	Handouts Ch. 28,29
23-27	Forming Processes - forging - rolling - extrusion and drawing - sheet metal forming - fabrication of plastics, and composites - rapid prototyping	Ch. 14 Ch. 13 Ch. 15 Ch. 16 Ch. 19 Ch. 20
28-30	- powder metallurgy of metals and ceramics - ceramics	Ch. 17 Ch. 18

Laboratory Schedule and Grading

Section 1: Tuesday 2:30-5:20pm

Section 2: Wednesday 8:30-11:20am

Section 3: Wednesday 2:30-5:20pm

<i>Week (Week of)</i>	<i>Topic</i>	<i>Room</i>	<i>Points</i>
1 Aug. 24	Orientation	ME1178 and student shop	
2 Aug. 31	Metrology	ME1178	50
3 Sept. 7	Metrology	ME1178	50
4 Sept. 14	Machining I	student shop	50
5 Sept. 21	Machining II	student shop	50
6 Sept. 28	Machining III	student shop	50
7 Oct. 5	CNC machining	ME 2028	50
8 Oct. 12	CNC machining	ME 2028 and student shop	50
9 Oct. 19	CNC machining	ME 2028 and student shop	50
10 Oct. 26	Micro fabrication	ME1030F	
11 Nov. 2	Micro fabrication	ME1030F	100
12 Nov. 9	3D Printing	MEG028	
13 Nov. 16	3D Printing	ME1191	100
14 Nov. 23	No lab (Thanksgiving Week)		
15 Nov. 30	Final Lab report	MEG028	