ME 363
Principles and Practice of Manufacturing Processes
Fall 2019
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

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

Teaching Assistants: Kyung-Min Hong, hong138@purdue.edu, MEG32

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%
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).

Syllabus

Periods	*Material*	*Reading*
1-5	Introduction, materials, metrology	
	- introduction	Introduction
	- metrology	Ch. 35
	- quality and process capability	Ch. 36
	- properties of materials	Ch. 2
6-8	Mechanics of cutting	Ch. 21
	- chip formation	
	- forces, stresses and power	
9-10	Cutting tools	Ch. 22, 25.8
	- machinability, tool life and wear	
	- economics of machining	
	- geometry and materials	
10-11	Machining processes	Ch. 23,24,25,26
	- turning, boring	
	- milling and grinding	
	- high speed machining	
12-14	CNC machining	Ch. 37
15	Exam #1	
16-19	Advanced manufacturing processes	Ch. 25.7,26.6, 27
	- nontraditional machining processes	
	- new and advanced manufacturing processes	
20-22	Micro/nano processes	Handouts
	- microfabrication	Ch. 28,29
23-27	Forming Processes	
	- forging	Ch. 14
	- rolling	Ch. 13
	- extrusion and drawing	Ch. 15
	- sheet metal forming	Ch. 16
	- fabrication of plastics, and composites	Ch. 19
	- rapid prototyping	Ch. 20
28-30	- powder metallurgy of metals and ceramics	Ch. 17
	- ceramics	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

Week	*(Week of)*	*Topic*	*Room*	*Points*
1	Aug. 19	Orientation	MEG028 and student shop	
2	Aug. 26	Metrology	ME1178	50
3	Sept. 2	Metrology	ME1178	50
4	Sept. 9	Machining I	student shop	50
5	Sept. 16	Machining II	student shop	50
6	Sept. 23	Machining III	student shop	50
7	Sept. 30	CNC machining	MEG028	50
8	Oct. 7	No lab. (October break)		
9	Oct. 14	CNC machining	student shop	50
10	Oct. 21	CNC machining	student shop	50
11	Oct. 28	Micro fabrication	ME1030F	
12	Nov. 4	Micro fabrication	MEG028	100
13	Nov. 11	Freeform fabrication	MEG028	
14	Nov. 18	Freeform fabrication	ME1191	100
15	Nov. 25	No lab (Thanksgiving Week)		
16	Dec. 2	Tour and Final Lab report	MEG028	