Course Overview

ME355 Introduction to Manufacturing Processes

Professor Junlan Wang
Winter 2015
Course Description

• Introduction to manufacturing processes, including interrelationships between the properties of the material, the manufacturing process and the design of components.

• Prerequisite: ME 354
Course Objectives

• This course is designed to provide students with an overview of a wide variety of manufacturing processes.
• The fundamental principles behind the processes will be discussed with the intent of providing a working knowledge of a broad range of manufacturing processes.
• Lab section has been designed to provide valuable hands-on experience in machining as well as working in teams.
• Students will fabricate a fan driven by a stirling engine.
Instructor

• Professor Junlan Wang
• Email: junlan@u.washington.edu
• Phone: 206-543-4601
• Office: MEB 208
• Office Hours: M W F 11:00-12:00 pm (or by appointment)
Teaching Assistants

- **Kevin Kadooka**
  - Email: kkado@u.washington.edu
  - Office hours: T & Th 4:00-5:30 pm
  - MEB 236 (TA conference room)

- **Zhou (Joe) Yang**
  - Email: yangz3@u.washington.edu
  - Office hours: W F 5:00-6:30pm
  - MEB 236 (TA conference room)
Laboratory Instructor

• Eamon McQuaide
  – Office: Engineering Annex 116A
  – Phone: 206-543-5548
  – Email: eamonm@uw.edu
Schedule

• **Lectures:** MWF 1:30pm-2:20 pm, MEB 238

• **Labs:** All labs in Engineering Annex 116
  
  – **AA:** Tuesday, 1:30-4:20 pm
  – **AB:** Wednesday, 2:30-5:20 pm
  – **AC:** Thursday, 9:30 am-12:20 pm
  – **AD:** Friday, 2:30-5:20 pm
Textbook


Yes, it is required.
Course Web Site

- [http://courses.washington.edu/me355b](http://courses.washington.edu/me355b).
  - Syllabus
  - Lecture notes
  - Assignments and solutions
  - Exam schedule and solutions
  - Lab hours and documents
  - Password for PDF files: UWME355A
Class Distribution List

• Whole class: me355a_wi15@uw.edu
  – AA: me355aa_wi15@uw.edu
  – AB: me355ab_wi15@uw.edu
  – AC: me355ac_wi15@uw.edu
  – AD: me355ad_wi15@uw.edu

Emails to these lists require approval from Prof. Wang

Your personal email will be used for instructor and TA to communicate with you, check at least once a day.
Course Format

• Lectures - three 50-minute lectures/week
• Homework
  – Assigned weekly (usually on Fridays)
  – Due at 1pm (following Fridays) in MEB front office hw box
  – Graded on 20 pts scale
    • 10 pts for completing all assigned problems
    • 10 pts for correct solution of the graded problem
  – Suggested Format
    • Briefly state the problem
    • If applicable, use Given/Find/Sol. or Given/Prove/Proof
    • Write on one side of the paper only
  – Partial solutions to be posted after the due date
  – Get questions clarified during TA office hours
Course Format (cont.)

- Labs
  - Will be solely handled by Lab Instructor
  - First lab this week on safety issues in machine shop
- Fan Project
  - You will make a 10 inch fan powered by a Stirling engine.
Fan Fabrication Project

• Each section makes a 10 inch fan powered by a Stirling engine.

• Students work in groups to develop a process plan, fabricate the components, and assemble and test the final product.

• A final presentation will be required in the 9th week.

• It is estimated that this project will take every individual approximately ten hours of out of class time to finish. So put in time early to avoid crisis at the end.
Fans from Spring 2012
Fans from Winter 2014
Fans from Spring 2014
Special Concerns on Labs

- **Safety First!** You are responsible for your safety and the safety of the people around you.

- You will be divided into teams of 2-4 people, each of which will be responsible for
  - Completing a weekly lab exercise,
  - Turn in a weekly progress report at end of each lab, and
  - Fabricating various components for the course fan project.

- What if you have to miss a lab?
  - Make the lab up during a different section’s time.
  - Be sure to notify lab instructors (and your partner), in advance, that you will be missing the lab.
Grading

- **Fan Project:** 25%
  - Weekly attendance/progress, process plan, quality of fabricated components
- **Homework:** 15%
- **Exams:** 20% each (×3)
  - Closed book, closed notes, one page cheat sheet
- **Final:** no final exam
- **Bonus:** up to 5%
  - Pop quiz
  - Survey
  - Classroom participation
Disability Accommodation

• Contact Disabled Student Service, 448 Schmitz Hall, 543-8924 (V/TTY)

• Discuss with instructor in advance
Tips for Success

• Come to class
  – You will get a lot more out of the class than just studying the lecture notes.
  – Class setting and atmosphere enhance learning, understanding and memory.

• Think big picture
  – Don’t get lost in details.

• Review previous lecture and read the chapters in advance if possible
  – If you have a clue going in, you will get much more out of class.
  – You will more likely need to study less and still get better grades.
Course Contents

• Introduction (1 lecture)
• Fundamental properties of materials
  – Mechanical behavior (1 lecture)
  – Structure and manufacturing properties (2 lectures)
  – Surface property and tribology (2 lectures)
• Manufacturing processes
  – Metal casting (3 lectures)
  – Bulk deformation (2 lectures)
  – Machining (3 lectures)
  – Joining (2 lectures)
  – Non-traditional machining (1 lecture)
  – Polymer, plastics and composites (3 lectures)
• Current manufacturing research (1 guest lecture)
• 3 mid-term exams and 3 review lectures
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Any questions?
Precourse Survey

• Clearly print your name
• Briefly answer
  – Do you have any prior manufacturing and/or machine shop experience? (No, Yes)
  – If yes, briefly describe your experience
    • Home project …
    • School project/student clubs …
    • Job …
    • Casting, welding, machining …. 