

## ME 3120 COURSE SYLLABUS

### MANUFACTURING PROCESSES AND THEIR APPLICATIONS ME 3120 – Summer 2015 - ONLINE

#### INSTRUCTOR

Rahul Sharan Renu  
136 Fluor Daniel Building  
rrenu@g.clemson.edu

#### OFFICE HOURS

Tuesday and Thursday 2:15PM-4:15PM(EST)

As this is an online course, you can see me in my office or Skype me (username: rahul.sharan.renu). Emails will receive a response only on weekdays. It may take me up to 12 hours to respond.

#### COURSE DESCRIPTION

Fundamental principles associated with production processes and their application to the manufacture of products from metals, polymers, ceramics, and composites. Emphasizes the physical and quantitative aspects of processing, the selection of processes to create products, and the identification of processes used to manufacture existing products.

**Prerequisite:** ME 308

**Corequisites:** ME 304, ME 306, ME 333

#### EXPECTATIONS

I expect the same of you that you do of me. I expect you to read all the weekly readings. I expect you to be intellectually prepared so that you may engage yourself in the learning process. Take a professional approach to the materials you prepare; and above all be honest and ethical in your work. This is particularly important for online courses as I am not able to monitor your use of resources during tests. I want you to learn much from this class. You can make this a fun class if you engage yourself in the material. Further, I expect you to be professional and ethical as this is an online course. **You will need access to internet in order to view video lectures.**

#### OBJECTIVES

You can expected to honor all course policies, view online classes lectures regularly, complete all assigned work on time and meet the course expectations. ***I reserve the right to modify this outline as the course progresses.*** See attached schedule for specific topics.

1. To teach the student a basic understanding of the fundamental processes used for manufacturing.
2. To show the student the engineering criteria that influence process selection to produce parts and products.
3. To demonstrate to the student the role of economics in the design and manufacture of parts.
4. To expose the student to the environmental and societal impact of manufacturing.

#### ETHICS

Again, ethical and professional behavior is expected from all students and the instructor at all times. Refer to the undergraduate handbook regarding university policy, especially with regards to academic dishonesty. The policy statement is:

*As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual*

*commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.*

## COMMUNICATION

The extra-class communication will take place using the Clemson University Blackboard system (<http://bb.clemson.edu>) and e-mail. Class grades, announcements, assignments, presentations and study aids will be posted there. ***It is your responsibility to check Blackboard and your CLEMSON.EDU email before every class period.*** For specific assistance with Blackboard, email [ets-1@CLEMSON.EDU](mailto:ets-1@CLEMSON.EDU)

## EMAILS

All emails to me must have the following subject - **ME3120 [LastName] [HW/Exam/Project]**

*For example: ME3120 Renu HW5*

All emails without the subject as stated may get lost in my email and hence may not receive a response.

## REQUIRED TEXT

Kalpakjian, S. and Schmid, S. Manufacturing Processes for Engineering Materials 5<sup>th</sup> edition, Prentice-Hall, 2008.

## GRADING & ASSIGNMENTS

The cumulative grade for the course will be calculated at the end of the semester according to the following weighting schedule:

<b>Homework</b>	<b>30%</b>
<b>Exam</b>	<b>30%</b>
<b>Final Exam</b>	<b>40%</b>

A → 90.00% - 100%

B → 80.00% - 89.99%

C → 70.00% - 79.99%

D → 60.00% - 69.99%

F → < 60.00%

## HOMEWORK

- Homework will be assigned every week, on Friday.
- You are given one week to complete the homework assignment. The homework must be submitted to me by 11:30PM EST Friday.
- Solutions should be neat, readable and understandable (engineering paper or prepared on computer). If I can't understand it, I can't grade it.
- Include a cover page on each homework set with your name, date, and homework number.
- Please restate the problem, including assumptions, knowns and unknowns.
- Work only one problem per page.
- Late homework will be corrected, but **will be discounted 20% for each day late. Turning in homework after 11:30 EST PM Friday counts as one day.**
- Scan and email your homework to [rrenu@g.clemson.edu](mailto:rrenu@g.clemson.edu) with the following subject title "ME3120.<student name>.<Homework Assignment>. <Date>"
  - For example: ME3120.RahulRenu.HW05.May18. **You must follow this format.**

- Each homework assignment should be submitted as a **single** .docx or .pdf document (.pdf preferred). Multiple files will not be accepted.
- Graded homework will be emailed to you.
- Assignment approaches may be discussed with your peers, but **all work turned in shall be your own, not a group effort.**
- Homework grading rubric (for each question)

0 points	1 points	2 points
Question not attempted	Question attempted*, but answer is incorrect	Question attempted and answer is correct

\* A question is counted as “attempted” only when the student has made a sincere effort to answer the question.

## EXAMS

- There will be (1) intra-semester exam and a final. ***You are responsible for all material covered in assigned reading, homework, and on lectures.*** All exams are comprehensive (any material studied up to that point is fair game) and closed-book, closed-notes except for an 8.5” x 11” single-sided handwritten sheet (turned in with exam).
- You must find a proctor to monitor your exam. ***Proctor must complete, sign and return proctor agreement form one week prior to first exam.*** The proctor will be emailed directions before each exam. The exam is to be submitted electronically (scanned and emailed) by the proctor.
- **Exam 1 will cover all material from lecture 1, 2, 3, 4, 5 and 6.**
- If exam is not returned before the deadline, **IT WILL NOT BE GRADED AT ALL.**
- It is your responsibility to check for exams that are graded and returned.
- If you feel that you have been maligned by the grading process, tests can be returned to me for regrading. However, ***the entire test will be regraded*** (this means that it is possible for your score to go *down* after regrading if I find errors that were previously missed). All regrade requests must be made within 2 days of exam return.

**SCHEDULE**

<b>Week number</b>	<b>Week of</b>	<b>Lecture number(s)</b>	<b>Subject</b>	<b>Video Lectures to watch</b>	<b>Weekly readings</b>	
1	11-May-15	0,1,2,3	Course Introduction; Introduction to Manufacturing; Material Structure and Failure; Fluids and Heat Transfer	Course Introduction; Introduction to Manufacturing; Material Structure and Failure (3 parts); Fluid and Heat Transfer Review	1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.10, 1.11, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.12, 3.1, 3.2, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 5.2, 5.4	
2	18-May-15	4,5,6	Surface Texture and Roughness; Casting Introduction; Casting Analysis	Surface Texture and Roughness (2 parts); Casting Introduction; Casting Analysis (3 parts)	4.1, 4.2, 4.3, 4.4, 4.5, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.12, Table 5.2, Table 5.3, Table 5.4	
3	25-May-15	7,8,10,11	Bulk Deformation Introduction; Forging Processes and Analysis; Rolling; Extrusion; Drawing	Bulk Deformation Introduction; Forging Analysis (2 parts); Bulk Deformation - Rolling (3 parts); Bulk Deformation - Extrusion; Bulk Deformation - Drawing;	3.7, 3.9, Table 3.5, Table 3.6, 3.11.1; 3.11.6; 6.1; 6.2; 6.3; 6.4; 6.5; 6.6; 6.7; 6.8; 6.9	Exam 1 (May25 - May26)
4	1-Jun-15	12,13	Sheet Metal Processing; Machining Processes and Equipment	Sheet Metal Forming (3 parts); Machining (Part 1 of 4)	7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 7.10, 8.1, 8.5, 8.6, 8.7	
5	8-Jun-15	14,15,16,17	Machining Forces and Power, Other Manufacturing Processes, Other Machining Processes	Machining (Parts 2, 3, 4 of 4)	8.2, 8.3, 8.6, 8.7, 8.8, 8.9, 8.10, 9.10, 9.11, 9.12, 9.13, 9.14, 9.15, 9.16, 9.17	
6	15-Jun-15	17,18,19,20	Polymers & Extrusion; Rapid Prototyping (Processes Overview)	Polymer Processing; Solid Concepts - Stereolithography Technology (Youtube); Solid Concepts - PolyJet Technology (Youtube); Solid Concepts - Fused Deposition Modeling Technology (Youtube); Solid Concepts - Selective Laser Sintering (SLS) Technology (Youtube)	10.1, 10.2, 10.4, 10.5, 10.6, 10.8, 10.10.1, 10.10.2, 10.10.3, 10.10.4, 10.10.5, 10.12, 10.12.1, 10.12.2, 10.12.3, 10.12.4	
<b>FINAL EXAMINATION</b>			<b>JUNE 18-June19</b>			