

# UNIVERSITY OF NORTH TEXAS

Department of Mechanical and Energy Engineering  
MEEN 3100 – Manufacturing Processes      Fall 2017

**Instructor:** Dr. Mark Wasikowski ([mark.wasikowski@unt.edu](mailto:mark.wasikowski@unt.edu))

**Course Time and Place:** MW 5:30 – 6:50 PM B185

**Office and Hours:** F101L. TBD

**Teaching Assistant:** TBD

**Catalog Course Description:** Major manufacturing processes, their capabilities, analysis, and economics. Study of the fundamentals of engineering processes in manufacturing as related to design and production and materials properties. Traditional and non-traditional manufacturing process and selection optimization. Students are given laboratory assignments in material removal, forming, casting, joining, forging, and computer aided machining

**Prerequisites:** MEEN/ENGR 2332 (Mechanics III, Stress); MTSE 3000/ENGR 3450 (Materials)

### **Course / Lab Topics:**

- Basic materials and manufacturing concepts, Metrology, Solidification Processes, Metal Forming, Material Removal Processes, Turning, Milling, Drilling, Cutting Tools, Grinding, Abrasion, Joining and Assembly Processes, Welding, Brazing, Soldering, Threaded Fasteners, Riveting, Additive Manufacturing (3-d printing), heat treatment, surface processing, automation, CNC, and robotics.

**Student Learning Objectives:** This class will address the following outcomes:

1. Describe / develop theory encountered in discipline of material science & manufacturing processes.
2. Develop ability to properly assess capabilities, limitations and potentials of manufacturing processes and their competitive aspects.
3. Describe new developments in materials, production methods, and computer integration of both technological and managerial activities in manufacturing.
4. Define, evaluate and select appropriate materials for design and manufacturing.
5. Apply computer aided manufacturing techniques.
6. Execute the practical aspects of manufacturing processes via laboratory experimentation.

**Textbook:** Fundamentals of Modern Manufacturing, 6<sup>th</sup> Ed, Groover, Wiley, is required textbook. Wiley's web based e-text and course management system is used. Students may choose either:

- a) Online course, with e-text, ISBN 9781119128663. This is the student access card for WileyPLUS Learning Space, which is designed around an interactive eBook. Students have option upon registering, and any time during course to purchase printed book at a discounted rate.
- b) Online course, with e-text and hardcopy, ISBN 9781119231288. This is shrink-wrapped set of printed textbook and WileyPLUS Learning Space Access.

**Communication:** Your official **UNT email** should be used for this course. The instructor and other students will contact you via the UNT email system. You must make sure to check your UNT account to make sure you receive all the course information. Blackboard will also be used in this class. Assignments, templates, etc. will be posted online for your convenience. If you have a cell phone, you may be able to configure your phone to allow receive Blackboard messages, which is very convenient. Any last-minute changes to daily schedule (such as class cancellation) is communicated by Blackboard.

**Disclaimer:** The instructor reserves the right to modify the course schedule, content and assignments when required as the course progresses. If a change is made, students will be notified in lecture ahead of time. The best way to stay up to date is to attend class. Exam date changes will be avoided if possible.

## **Grade Assessment (straight 90/80/70/60 scale)**

Mid Term Exam 1 (10/18)	15%
Mid Term Exam 2 (12/6)	15%
Real Hands On Labs (5 - 10)	35%
Field Trip Labs (2 @ 5% each)	10%
REEF Participation	15%
Homework (on-line)	10%

**Exams:** Two midterm exams (no final exam during finals week) are provided to assess of lecture material comprehension, reading assignments, homework and lab assignments. Exams are multiple choice, true/false, calculations, etc.

**Homework / Quizzes:** homework is assigned each week and may consist of reading comprehension questions from the e-text prior to lectures, as well as calculation problems after lectures. Quizzes over reading material and lectures are also given each week. Both homework and quizzes cover short term material each week and are all facilitated on-line via the WileyPLUS learning space. The course is more qualitative than quantitative.

**Attendance/Participation:** lecture format consists of interactive PowerPoint with REEF participation. **Students must have a mobile device for class - iPhone, laptop, etc.** Interactive in class REEF based quizzes are integrated with lecture to engage students in discussion.

**DP Lab Schedule:** register for one of 15 three hour sections offered 6 days / week. Labs are closed, not open. Students must attend lab section registered for. Attendance is mandatory. Lab is normally located in F157. However, some labs are in J105. Laboratory exercises reinforce lectures by experiment. Lab exercises generally follow the lecture topic, lagging by a week or two. Each lab section is limited to 8 students due to safety, and monitored by a teaching assistant. No shop work may be performed without a TA present. Labs are group learning efforts, but each student performs the lab and shows the TA the results for credit. It is not group lab grading. Excusable absences are accepted only if student informs professor before the event such as illness and non-reschedulable prior appointments, after the event, such as medical or other emergencies, within a reasonable time frame. In all cases, academic honesty is expected. Lab schedule will be announced in class. Laboratories that are missed may not be able to be made up, depending on the lab schedule.

**Field Trip Labs:** Each student must reach to two local manufacturing companies and schedule a tour during the fall. Students may attend in small groups, if desired. Field trip requirements will be distributed in class.

**Inclement Weather:** Adhere to UNT notification system or local weather for school closings.

**Disability Policy:** All reasonable accommodation will be made to facilitate special needs. If special accommodations are required, the student must first meet with the staff of the Office of Disability Accommodation (ODA), Union Suite 322, (940) 565-4323. After meeting with that office, please contact me to discuss what accommodations will be necessary. For more information, see <http://www.unt.edu/oda>

**Dishonesty:** Any form of dishonesty during the semester will result in a final grade of F for the course and a recommendation for expulsion to the Provost. No exceptions. Please avoid cheating or any other form of misconduct. If you are having personal challenges, please talk to the instructor.

**Calculators:** only calculators approved for course are those permitted on Fundamentals of Engineering (FE) exam toward Professional Engineer (PE) licensing:

- 1) Hewlett Packard—HP 33s and HP 35s models, but no others.
- 2) Casio—All fx-115 and fx-991 models. Any Casio calculator must contain fx-115 or fx-991 in its model name.
- 3) Texas Instruments: All TI-30X and TI-36X models. Any TI calculator must contain either TI-30X or TI-36X in its model name



**Tentative Schedule** (Instructor reserves the right to modify. Changes will be announced in class)

Date	Category	Unit	Chapter	Tentative Labs
8/28	Introduction		1	Safety / Hand Tools MWF Sections
8/30	Metrology	Metrology	5	
9/4	<b>Labor Day</b>			Safety / Hand Tools TR Sections
9/6	Solidification Processes	Casting	10-11	Metrology
9/11	Solidification Processes	Casting	13	
9/13	Metal Forming	Rolling, Forging	17,18	
9/18	Metal Forming	Sheet Metal	19	Casting / Sheet Metal
9/20	Metal Forming	Sheet Metal	19	
9/25	Material Removal	Overview	20-21	Casting / Sheet Metal
9/27	Material Removal	Turning	21	
10/2	Material Removal	Mill	21	Lathe / Mill
10/4	Material Removal	Drilling	21	
10/9	Material Removal	Cutting Tools	22	Lathe / Mill
10/11	Material Removal	Grinding & Abrasion	24	
10/16	<b>Review</b>			<b>No Lab - Mid Term</b>
10/18	<b>Mid Term 1</b>			
10/23	Joining and Assembly	Welding	28,29	Lathe / Mill Drilling / Grinding
10/25	Joining and Assembly	Brazing, Soldering	30	
10/30	Joining and Assembly	Threaded Fasteners	31	Welding
11/1	Joining and Assembly	Riveting	31	
11/6	Additive Manufacturing	3-D printing	32	Welding
11/8	Additive Manufacturing	3-D printing	32	
11/13	Property Enhancement	Heat Treat	26	Welding
11/15	Property Enhancement	Surface Processing	27	
11/20	Automation	CNC	37	<b>No Lab - Thanksgiving</b>
11/22	Automation	CNC	37	
11/27	Automation	Robotics	37	CNC / Robotics
11/29	Automation	Robotics	37	
12/4	<b>Review</b>			<b>No Lab</b>
12/6	<b>Mid Term 2</b>			

**F157 / J105 Laboratory Section Schedule:**

	M	T	W	TH	F	S
8-9	Reserved Senior Design	311	Reserved Senior Design	312	Reserved Senior Design	Reserved Senior Design
9-10						
10-11	301	Staff Break	305	Staff Break	309	Staff Break
11-12						
12-1	Staff Break	303	Staff Break	307	Staff Break	313
1-2						
2-3	302	304	306	308	310	314
3-4						
4-5	Staff Break		Staff Break			
5-6	Reserved Senior Design	Reserved Senior Design	Reserved Senior Design	Reserved Senior Design	315	
6-7						
7-8						

**Trained Teaching Assistant MUST be present in all labs to supervise safety**