

1: Course Number and Name

- a. **MENG 3353:** Manufacturing Processes and Systems, Spring 2022
- b. Section 010, MW 2:00 – 2:50 pm
- c. Section 01z, T 3:30-5:20

2: Credits and Contact Hours

- a. **Credits:** 3
- b. **Contact Hours:** 2 hours/week (Classroom), 2 Hours/week (Lab)

3: Instructor Information

- a. **Course Coordinator:** Armita Hamidi
- b. **Instructors:** Armita Hamidi
Email: armita.hamidi@angelo.edu.
Phone: 325-486-5518
Office: VIN 273.
- c. **Office hours:** Mondays & Wednesdays 3:30 pm -5pm (face to face in VIN 273 or virtual through Blackboard Collaborate).
Please try to make an appointment by email for face to face meeting outside office hours.
When sending an email, make sure to include class and section number (e.g. MENG 3353, 010).

4: Required Course Materials

Readings and course materials will be posted on Blackboard. You do not need to purchase a textbook.

The recommended book for this course which can be used as a reference is:

Kalpakjian, Serope, and Steven R. Schmid. 2003." *Manufacturing processes for engineering materials*", Pearson education, 6th edition.

5: Technology Requirements

- a. To successfully complete this course and access course materials, students need:
 - A computer capable of running Windows 7 or later, or Mac OSX 10.8 or later
 - The latest version of one of these web browsers: Internet Explorer, Firefox, or Safari
 - Adobe Acrobat Reader
 - High-Speed Internet Access
- b. Access to exams and quizzes may be through Respondus Lockdown Browser and will be video recorded via Respondus Monitor. Respondus requires a desktop computer or laptop and a webcam. For best results, use an ethernet cable to connect to your Internet source instead of relying on Wifi. Refer to the Blackboard course for Respondus installation instructions. For secure online testing, you need to install Respondus and Respondus LockDown Browser and require a webcam.
- c. Software requirements:
 - Microsoft Office: You can access Word, Excel, PowerPoint with your ASU email. Angelo State has partnered with Microsoft to make Office 365 available to students.

- CAD software: You need to access CAD software to prepare designs for the Labs and projects. You can use any CAD software such as Solidworks, Creo, Autodesk Inventor, etc.

6: Specific Course Information

- Catalog Description:** Introduction to manufacturing processes, manufacturing equipment, and planning and control of manufacturing systems. The role of manufacturing and its relation to engineering materials design, control and its importance for society will be addressed. The course includes practical project learning experiences
- Prerequisites:** ENGR 3331
- Required or elective:** Technical elective for the BSME Major.

7: Specific Goals for the Course

- Course Learning Outcomes:
 - Describe the fundamentals and applications of a variety of manufacturing processes involving different formation physics and materials.
 - Explain the relation among product design and engineering factors that influence process selection to produce parts and products at the various cost involved.
 - Describe sources of variation in manufacturing processes, and explain how to monitor and control variation using statistical methods.
 - Use process demonstrations, example components, hands on experiments and videos to reinforce the principles of process physics, design for manufacturing, and factory operation.
 - Working as a team, preparing a manufacturing project proposal and practice basic selection of a manufacturing processes in the context of a process chain to build and present the proposed prototype.
 - Describe the manufacturing process of some of the most common parts and products in modern industry.
- Course Learning Outcome Mapping to ABET Criterion 3 Student Outcomes:

Table 1: Course Learning Outcomes mapped to ABET Student Outcomes

ABET Student Outcomes	1	2	3	4	5	6
1. Solve Problems	X	X				
2. Design		X			X	X
3. Communication						
4. Ethics & Professionalism						
5. Teamwork					X	
6. Experimentation				X	X	
7. Acquire New Knowledge		X		X	X	

8: Topics Covered

- Fundamentals of manufacturing processing & review on starting materials
- Metal works: Sheet metal Processes, Machining, Metal casting
- Polymer processing: Injection Molding
- Additive manufacturing

9: Course Delivery and Communications

9.1: Delivery Method(s)

This is a face-to-face course with learning resources and supplemental materials posted in [Blackboard](#)¹. Lab sections will be held face to face.

9.2: Communications

Faculty will respond to email and messages within 24 hours during working hours Monday through Friday. Weekend messages may not be returned until Monday.

Written communication via email: All private communication will be done exclusively through your ASU email address. Check frequently for announcements and policy changes. In your emails to faculty, include the course name and section number in your subject line.

Virtual communication: Office hours and/or advising may be done with the assistance of the telephone, Collaborate, Skype, etc.

10: Professionalism

Professional engineering standards apply in this class. You are expected to demonstrate a behavior consistent with the conduct of an individual practicing in the engineering profession. You are expected to: (1) come prepared for class; (2) respect faculty and peers; (3) demonstrate responsibility and accountability for your own actions; (4) demonstrate sensitivity and appreciation for diverse cultures, backgrounds, and life experiences; (5) offer and accept constructive criticism in a productive manner; (6) demonstrate an attitude that fosters professional behavior among peers and faculty; (7) be punctual to class meetings; (8) maintain a good work ethic and integrity; and (9) recognize the classroom as a professional workplace.

11: Graded Material

11.1: Class Attendance, Participation, Timeliness and Teamwork

The number one complaint of engineering clients is the timeliness of deliverables (reports, drawings, specifications, etc.). As a professional engineer you will be expected to arrive at scheduled meetings on time and prepared. Late proposals are not generally accepted. Late specifications or drawings may cost the engineer a monetary penalty. Professional engineering standards apply in this course.

You are expected to meet every class meeting on time and prepared. Attendance will be taken. Should you find it necessary to miss a class for any reason, you are expected to notify your instructor as early as the absence is known—preferably before the absence. It's important that you communicate clearly your instructors.

Your online assignments, lab reports and project submission will be due at the time specified on Blackboard. Any assignments submitted in hard copy are due at the beginning of class on the due date. Your instructor may assess penalties for late work.

11.2: Reading Assignments and Homework

You will be given reading and homework assignments nearly every lesson. Reading assignments will come from the assigned textbooks or other materials provided or available via the web. The homework assignments will consist of questions to be answered during your reading and preparation for class. Reading and homework assignments will be distributed via the Blackboard.

11.3: Quizzes

Instructors may give in-class quizzes. The quizzes will be unannounced and unscheduled. The quizzes are intended to determine whether or not you have completed the pre-class work and are prepared for class.

11.4: Lab Experiments

Participation in Lab sessions expected from all students. Zero points will be awarded for missed lab sessions. These lab experiments cannot be made up.

11.5: Project

There will be one team project for this class requiring some hands-on experiments. The project will involve design and fabricate a prototype using methods and machines described during the class.

11.6: Exams

This course will have three exams, two mid-terms and a final. Exams will be taken in person. The student is responsible to arrange a make up exam with the instructor in case of missing any exam.

11.7: Grades: Weighting and Letter Grades

The weighting system shown in Table 2 will be used in determining final grade for the course

Table 2: Grade Weighting

Item	Percent
Homework	20%
Quizzes	10%
Lab reports	15%
Project	20%
Exam 1	10%
Exam 2	10%
Final Exam	15%
Total	100%

The instructor will determine letter grades for the course using his professional judgment, and the following standards as described in the University Catalog:

A = excellent work B = good work C = average work D = poor work F = failing work

12: General Policies Related to This Course

12.1: General Policies

All students are required to follow the policies and procedures presented in the [Angelo State University Student Handbook](#)² and [Angelo State University Catalog](#)³.

12.2: Student Disability Services

ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or

activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student's responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the [Student Disability Services website](#)⁴. The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu
Houston Harte University Center, Room 112

12.3: Title IX at Angelo State University

Angelo State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. In accordance with Title VII, Title IX, the Violence Against Women Act (VAWA), the Campus Sexual Violence Elimination Act (SaVE), and other federal and state laws, the University prohibits discrimination based on sex, which includes pregnancy, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination and unwelcome behavior of a sexual nature. The term includes sexual harassment, nonconsensual sexual contact, nonconsensual sexual intercourse, sexual assault, sexual exploitation, stalking, public indecency, interpersonal violence (domestic violence or dating violence), sexual violence, and any other misconduct based on sex.

You are encouraged to report any incidents involving sexual misconduct to the Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator, Michelle Miller, J.D. You may submit reports in the following manner:

Online: [Incident Reporting Form](#)⁵

Face to Face: Mayer Administration Building, Room 210

Phone: 325-942-2022

Email: michelle.miller@angelo.edu

Note, as a faculty member at Angelo State, I am a mandatory reporter and must report incidents involving sexual misconduct to the Title IX Coordinator. Should you wish to speak to someone in confidence about an issue, you may contact the University Counseling Center (325-942-2371), the 24-Hour Crisis Helpline (325-486-6345), or the University Health Clinic (325-942-2171).

For more information about resources related to sexual misconduct, Title IX, or Angelo State's policy please visit: www.angelo.edu/title-ix⁶.

12.4: Observance of Religious Holy Day

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 Student Absence for [Observance of Religious Holy Day](#)⁷ for more information.

12.5: Incomplete Grade Policy

It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 [Grading Procedures](#)⁸ for more information.

12.6: Information About COVID-19

Please refer to ASU's [COVID-19 \(Coronavirus\) Updates](#)⁹ web page for current information about campus guidelines and safety standards as they relate to the COVID-19 pandemic.

12.7: Student Conduct Policies

12.7.1: Academic Integrity

Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

The College of Science and Engineering adheres to the university's [Statement of Academic Integrity](#)¹⁰ (Page 97).

12.7.2: Plagiarism

Plagiarism is a serious topic covered in ASU's [Academic Integrity policy](#)¹¹ in the Student Handbook. Plagiarism is the action or practice of taking someone else's work, idea, etc., and passing it off as one's own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list.

Papers are subject to be evaluated for originality via Turnitin or SafeAssign. Resources to help you understand this policy better are available at the [ASU Writing Center](#)¹².

12.7.3: Copyright Policy

Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.

13: Modifications to the Syllabus

This syllabus, including grade evaluation and course schedule, is subject to modification on potentially short notice based on developing circumstances.

14: Course Schedule

The course outline is presented in the table next page. Detailed reading and homework assignments along with updates to this schedule will be provided via Bb. The following schedule may be modified as the semester progresses.

Table 3: Course Lesson Outline

Week	Date	Topic	Assignment
1	19-Jan	Introduction	
	24-Jan	Fundamentals of Manufacturing processing	
	26-Jan	Fundamentals of Manufacturing processing	
2	31-Jan	Starting materials	
	2-Feb	Starting materials	Homework #1
3	7-Feb	Starting materials: Metals	
	9-Feb	Starting materials: Polymers	Homework #1 due
4	14-Feb	Sheet metal Process	
	16-Feb	Sheet metal Process	Homework #2
5	21-Feb	Sheet metal Process	
	23-Feb	Sheet metal Process	Homework #2 due
6	28-Feb	Machining	Homework #3
	2-Mar	Machining	
7	7-Mar	Machining	Homework #3 due
	9-Mar	Exam 1	
8	14-Mar	Spring Breaks	
	16-Mar	Spring Break	
9	21-Mar	Casting	
	23-Mar	Casting	
10	28-Mar	Casting	Homework #4
	30-Mar	Injection Molding	
11	4-Apr	Injection Molding	Homework #4 due
	6-Apr	Injection Molding	
12	11-Apr	Injection Molding	Homework #5
	13-Apr	Additive manufacturing	
13	18-Apr	Exam 2	Home work #5 due
	20-Apr	Additive manufacturing	
14	25-Apr	Additive manufacturing	Homework #6
	27-Apr	Additive manufacturing & Review	
15	4-May	Review	Homework #6 due
	6-May	Project Presentation	Project due
	9-May	Final Exam	3:30-5:30 pm (checked on ASU final exams Schedule)

Table 4: Lab Lesson Outline

week #	Date	Topic	Concept
1	25-Jan	Lab 0: Safety Introduction	Safety
2	1-Feb	Lab 1: Introduction	How to use hand tools & measurement instruments
3	8-Feb	Lab 2: sheet Metal Processing	Working with foot shear machine and Break press machine, building a sample prototype with sheet metal
4	15-Feb	Lab 3: Rolling	Working on Slip roll and building a sample
5	22-Feb	Lab 4: Machining	Demonstrating lathe, CNCs and related machining tools
5	1-Mar	Lab 4: Machining	Work with CNC
6	8-Mar	Lab 5: Welding	Learn Basics of Welding
7	15-Mar	Spring Break	
8	22-Mar	Lab 5: Welding	Learn Basics of Welding
9	29-Mar	Lab 5: Welding	Learn Basics of Welding
10	5-Apr	Lab 5: Injection Molding	Demonstrate Injection molding process and how to set up injection molding machines and discuss the parameters that result in defects on the fabricated part
11	12-Apr	Lab 6: Additive Manufacturing	How to use 3D printers
12	19-Apr	Lab 7: Laser cutter/engraver	How to use laser cutter/engraver
13	26-Apr	Project hands on	Start building the prototype based on approval of proposal

15: End Notes

¹ <https://blackboard.angelo.edu/>

² <http://www.angelo.edu/student-handbook/>

³ <http://www.angelo.edu/catalogs/>

⁴ <http://www.angelo.edu/services/disability-services/>

⁵ <https://www.angelo.edu/incident-form>

⁶ <http://www.angelo.edu/title-ix>

⁷ <http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of>

⁸ <https://www.angelo.edu/content/files/14197-op-1011-grading-procedures>

⁹ <https://www.angelo.edu/covid-19/>

¹⁰ <https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=97>

¹¹ <http://www.angelo.edu/student-handbook/community-policies/academic-integrity.php>

¹² http://www.angelo.edu/dept/writing_center/academic_honesty.php