1: Course Number and Name

a. **MENG 4380**: Mechanical Engineering Capstone Design II, Spring 2022
b. Section 010, F 08:00 – 08:50 am
c. Section 01Z, F 1:00 – 4:50 pm

2: Credits and Contact Hours

a. **Credits**: 3
b. **Contact Hours**: 1 hour/week (Classroom) & 4 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 -5 pm (face to face in VIN 273 or virtual through Blackboard Collaborate).
Please try to make an appointment by email for face to face meeting. When sending an email, make sure to include class and section number (e.g. MENG 4352, 010).

4: Required Course Materials

Dieter, G. E., and Schmidt, L. C. (2021), Engineering Design, (6th Ed.), McGraw Hill Education.

5: Technology Requirements

- To successfully complete this course, students need to use a wide range of software depending on your project need, you may find most of the software's on the Virtual Engineering Machine and/or you can contact IT Service Center to install in your personal computer.

6: Specific Course Information

a. **Catalog Description:** Mechanical Engineering capstone experience. Engineering concepts integrated from topics taught in sequences of upper-division courses to produce practical, efficient and feasible solutions of mechanical engineering problems. Computer applications are included. Final oral and written reports are required.
d. **Prerequisites**: Mechanical Engineering Capstone Design I. Department Permission.
e. **Required or elective**: Required.

7: Specific Goals for the Course

a. Course Learning Outcomes:
1. Apply the knowledge and skills acquired in their undergraduate curriculum to a physical design project.

a) be able to work with vendors to purchase parts/elements and apply basic manufacturing skills to build and assemble prototype.

b) be able to perform meaningful tests and evaluate prototype for verification and validation of the design (proposed in Capstone design I) and meeting client specification and criteria requirements. Propose any improvements for future (if you were to make another one). Be able to deliver a working prototype to the project client in time.

2. Develop the ability to address a broad range of design requirements such as performance, risk, safety, ethics, economic, environment, social, regulatory, and manufacturing.

   c) be able to identify problem and specify design requirements applicable to realistic constraints.

   d) be able to perform risk assessment of your prototype.

   e) be able to create a user manual that include safety handling, servicing information.

3. Prepare for professional design environment through teamwork, communication, and presentation.
   f) be able to clearly communicate design ideas and information by preparing presentation and detail report.
   g) be able to work collaboratively and responsibly as a team.

Table 1: Course Learning Outcomes mapped to ABET Student Outcomes

ABET Student Outcomes	a	b	c	d	e	f	g
1. Solve Problems		X			X		
2. Design			X	X			
3. Communication	X				X	X	
4. Ethics & Professionalism		X			X		
5. Teamwork	X	X		X	X	X	X
6. Experimentation		X		X			
7. Acquire New Knowledge		X					

8: Topics Covered

1. Safety and Risk assessment
2. Environmental and Sustainability consideration
3. Report writing
4. Project Presentation

9: Course Delivery and Communications

9.1: Delivery Method(s)

This course has two significant components: One 1-hour review sessions per week and one 4 hours laboratory session per week. On-time attendance of sessions is REQUIRED. This is a face-to-face course with learning resources and supplemental materials posted in Blackboard.

For each review session, you are expected to have completed your assigned milestone and come prepared to present your weekly progress to the team. There will brief review sessions on specific topics at the beginning, followed by individual progress report, peer evaluation & feedback, set the next week goal. A team leader and associate team leader will be elected who will manage the overall progress, act as point of contact with industry/vendor/supplier, and coordinate.

For each laboratory session, you are expected to work on your physical model of your project.

A student's responsibility includes but not limited to 1) plan your individual contribution, 2) clearly set your own goals and share with team, 3) monitor and assess your own progress, and evaluate/compare with your peers, 4) work alone, as a team, collaborate and support your team members as appropriate. The performance will be assessed based on your individual contribution and overall team achievements.

The value of the course to you will be highly dependent upon your preparation for class. We will be using both Blackboard, and email to communicate during this course. Lesson materials will be delivered via Blackboard.[1]

9.2: Communications

Faculty will respond to email 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 Team viewer, Zoom, 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, and Timeliness

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 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

There is no HW assignment, your main goal is to complete constructing the physical prototype, submit the final report and present to the committee.

11.3: Punctuality

As a professional engineer you are expected to arrive at every class meeting on time and prepared. Attendance will be taken. Arriving late or leaving early will be counted as an absence. 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.

11.4: Journal

You are expected to keep a written journal for this course. Your weekly presentation will represent the summary of your journal. These weekly individual and team presentations will be assessed for your performance, will be archived and may be carried on to your Capstone Design II course.

11.5: Grades: Weighting and Letter Grades

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

Table 2: Grade Weighting

Item	Percent
Attendance & Participation & professionalism	10%
Committee evaluation	10%
Functional prototype	20%
Design, Safety, Risk Analysis	25%
Engineering standards	5%
Final Report	30%
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

Table 3: Grading Scale

Letter Grade	Number Grade
A	≥ 90
B	[80 – 90)
C	[70 – 80)
D	[60 – 70)
F	< 60

12: Classroom and University Policies and Student Support

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-ix[6].

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 Outline

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	Review/Discussion Session	Project Milestone
1	21-Jan	Weekly meeting and Lab Safety and Risk assessment (literature & Standards)	Status update, review design prepared in Capstone Design I, and plan project construction.
2	28-Jan	Weekly meeting and Lab Environmental and Sustainability (Standards)	Build project, Update client, Record in report with detail procedure (image, numerical detail, instrument etc.)
3	4-Feb	Weekly meeting and Lab Safety and Risk assessment (literature & Standards)	Build project, Update client, Record in report with detail procedure (image, numerical detail, instrument etc.)
4	11-Feb	Weekly meeting and Lab Environmental and Sustainability (Standards)	Build project, Update client, Record in report with detail procedure (image, numerical detail, instrument etc.)
5	18-Feb	Weekly meeting and Lab	Build project, Update client, Record in report with detail procedure (image, numerical detail, instrument etc.)

week #	Date	Review/Discussion Session	Project Milestone
6	24-Feb	Weekly meeting and Lab	Build project, Update client, Record in report with detail procedure (image, numerical detail, instrument etc.)
7	4-Mar	Weekly meeting and Lab	Complete Physical Project
8	11-Mar	Weekly meeting and Lab	Prepare prototype test plan and prepare
	18-Mar		Spring break
9	25-Mar	Weekly meeting and Lab	Perform test on prototype and analyze
10	1-Apr	Weekly meeting and Lab	Improve and/or recommendation
11	8-Apr	Weekly meeting and Lab	Submit draft report (Version 1)
12	15-Apr	Weekly meeting and Lab	Submit PowerPoint presentation (Version 1)
13	22-Apr	Weekly meeting and Lab	Finalize presentation and report
14	**29-Apr**		**Final Presentation IAC members and Committee**

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