1 Course Number and Name
   a. **MENG 4279:** Mechanical Engineering Capstone Design I, Fall 2021
   b. **Lecture:** Sec 010 9:00 am - 9:50 am, Friday
      **Lab:** Sec 01Z 1:00 pm - 2:50 pm, Friday

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

3 Instructor Information
   a. **Course Coordinator:** Armita Hamidi
   b. **Instructor:** Armita Hamidi, 325-486-5518, armita.hamidi@angelo.edu, Office: VIN 272. For office hours see faculty homepage.

4 Required Course Materials
   b. **Other supplemental materials:** Will be posted on Blackboard® Learning Management System.

5 Technology Requirements
   This requires internet access and the ability to use the following online tools: Blackboard, Blackboard Collaborate, and Microsoft Office.

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.
   b. **Prerequisites:** Senior standing within two semesters of graduation. Departmental permission.
   c. **Required or Elective Course:** 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 identify relevant topics from earlier courses and apply them to design project.
         b) be able to critically evaluate designs using engineering criteria and predictive usage.
      2. Develop the ability to address a broad range of design requirements such as performance, risk, safety, economic, environment, social, regulatory, and manufacturing.
         c) be able to identify problem and specify design requirements applicable to realistic constraints.
d) be able to systematically develop a design from the problem statement to a detailed, proof-of-concept design meeting all of the specifications.

3. Prepare for professional design environment through teamwork, communication and presentation.
   e) be able to clearly communicate design ideas and information.
   f) be able to work collaboratively and responsibly as a team.
   g) demonstrate the ability to facilitate their learning by identifying design issues and questions that require additional investigation beyond their basic undergraduate curriculum knowledge, then formulating appropriate courses of action.

B. Course Learning Outcome Mapping to ABET Criterion 3 Student Outcomes:

Table 1: Course Learning Outcomes mapped to ABET Student Outcomes

<table>
<thead>
<tr>
<th>ABET Student Outcomes</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Solve Problems</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
<td>X</td>
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<tr>
<td>2. Design</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td></td>
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<td>X</td>
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<tr>
<td>3. Communication</td>
<td></td>
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<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4. Ethics &amp; Professionalism</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. Teamwork</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
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<td></td>
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<tr>
<td>6. Experimentation</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>7. Acquire New Knowledge</td>
<td>X</td>
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<td></td>
<td>X</td>
</tr>
</tbody>
</table>
8 Course Delivery and Communications

8.1 Delivery Method
This is a face-to-face course with learning resources and supplemental materials posted in Blackboard. Accommodations will be made for students who are in quarantine or isolation and are unable to attend.

For each session, you are expected to have completed your assigned milestone and come prepared to present your weekly progress to the team. There will be 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.

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. A capstone project is time sensitive, you are expected to reply each email within 48 hours, if you do not have a specific answer, you should email saying when you will be able to reply and/or send your questions or any help needed. Lesson materials will be delivered via Blackboard.

8.2 Communications
You may communicate with me via Blackboard discussion board, email, phone, or via GroupMe text.

I will respond to email or telephone 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.

Office hours or advising may be arranged with the assistance of Collaborate, Zoom, or another web meeting platform

9 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.

10 Graded Material
Table 2 presents the grade weighting:
# Class Attendance, Participation, Timeliness and Teamwork

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.

Nearly all worthwhile accomplishments from raising a family to launching the space shuttle are the work of teams. All significant engineering projects are completed by teams. You will be assigned to a team for the capstone project. The purpose of the team is to give you practice working together and to provide a support group for you within the class.

# Assignment, Presentation, and Final Report

You are required to submit individual weekly progress report as an assignment. An individual weekly report must include the work you completed in the previous week and your proposed task for next week. Your team is required to present a 1st draft proposal and a 2nd revised proposal presentation and submit presentation slides to your client, ME faculty, and department chair. A final comprehensive design report is due at the end of the semester.

# 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.

# Grades:

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 of Grading Components

<table>
<thead>
<tr>
<th>Item</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance, Participation, weekly progress &amp; Professionalism</td>
<td>20%</td>
</tr>
<tr>
<td>Peer Evaluation</td>
<td>10%</td>
</tr>
<tr>
<td>Concept Models</td>
<td>20%</td>
</tr>
<tr>
<td>Design Analysis</td>
<td>20%</td>
</tr>
<tr>
<td>Final proposal</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
**10.5 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](#) for more information.

**11 Classroom and University Policies and Student Support**

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

**11.1 Accommodations for Students with Disabilities**

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](mailto:ADA@angelo.edu). For more information about the application process and requirements, visit the [Student Disability Services website](#). The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

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

**11.2 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
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 the Title IX website.

11.3 Student Absence for Observance of Religious Holy Days

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 for more information.

11.4 Information About COVID-19

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

11.5 Student Conduct Policies

11.5.1 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.

11.5.2 Plagiarism

Plagiarism is a serious topic covered in ASU’s Academic Integrity policy 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.
11.5.3 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.

12 Course Outline

The course outline is presented in Table 4. Detailed reading and homework assignments along with updates to this schedule will be provided via Bb or email. The schedules may be modified as the semester progresses.

Table 4: Lecture Lesson Outline

<table>
<thead>
<tr>
<th>Week</th>
<th>Review/Discussion Session</th>
<th>Project Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (August 23-27)</td>
<td>Introduction and Presentation of the suggested Design Projects</td>
<td>Discussion to select the project</td>
</tr>
<tr>
<td>2 (August 30- September 3)</td>
<td>Product Development and Team Behavior</td>
<td>Project identification and requirements</td>
</tr>
<tr>
<td>3 (September 6-10)</td>
<td>Concept generation, decision making and selection</td>
<td>Primary Design Concept</td>
</tr>
<tr>
<td>4 (September 13-17)</td>
<td>First Draft of Proposal</td>
<td>First Design Proposal</td>
</tr>
<tr>
<td>5 (September 20-24)</td>
<td>Incorporate committee Feedback</td>
<td>Detail Design Analysis</td>
</tr>
<tr>
<td>6 (September 27 - October 1)</td>
<td>Embodied Design, Detail Design</td>
<td>Detail Design Analysis</td>
</tr>
<tr>
<td>7 (October 4-8)</td>
<td>Cost Evaluation</td>
<td>Material selection, part identification, component list</td>
</tr>
<tr>
<td>8 (October 11-15)</td>
<td>Risk, Reliability, and Safety</td>
<td>Review standards, finalize drawings</td>
</tr>
<tr>
<td>9 (October 18-22)</td>
<td>Second Design Proposal</td>
<td>Second detail Design Proposal</td>
</tr>
<tr>
<td>10 (October 25-29)</td>
<td>Incorporate committee Feedback</td>
<td>Complete Design and components</td>
</tr>
<tr>
<td>11 (November 1-5)</td>
<td>Legal &amp; ethical issue</td>
<td>Complete Purchase list and sourcing</td>
</tr>
<tr>
<td>Week</td>
<td>Action</td>
<td>Notes</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>12</td>
<td>Final Draft of proposal</td>
<td>Final Complete Design Proposal</td>
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<tr>
<td>(Nov 8-12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Incorporate committee Feedback</td>
<td>Complete Component List</td>
</tr>
<tr>
<td>(Nov 15-19)</td>
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<tr>
<td>14</td>
<td>Review Final Feedback</td>
<td>Incorporate feedback, correction</td>
</tr>
<tr>
<td>(Nov 22-26)</td>
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<tr>
<td>15</td>
<td>Approval of final Report</td>
<td>Ready for Capstone Design II</td>
</tr>
<tr>
<td>(Nov 29 – Dec 3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**End Notes**

1. angelo.blackboard.com
2. [https://www.angelo.edu/content/files/14197-op-1011-grading-procedures](https://www.angelo.edu/content/files/14197-op-1011-grading-procedures)
4. [https://www.angelo.edu/academics/catalog/](https://www.angelo.edu/academics/catalog/)
5. [https://www.angelo.edu/current-students/disability-services/](https://www.angelo.edu/current-students/disability-services/)
6. [https://www.angelo.edu/incident-form](https://www.angelo.edu/incident-form)
7. [https://www.angelo.edu/title-ix](https://www.angelo.edu/title-ix)
8. [http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of](http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of)
9. [https://www.angelo.edu/covid-19/](https://www.angelo.edu/covid-19/)