CENG 4380: Civil Engineering Senior Design

1: Course Logistics
- Semester: Fall 2020
- Section: 010
- Class Days: Friday
- Class Time: 8:00am – 8:50am
- Project Time: 1:00pm – 4:50pm
- Class Location: VIN 245

2: Instructor Information
- Instructor: Anthony Battistini, PhD
- Email: anthony.battistini@angelo.edu
- Phone: (325) 486-5511
- Office: Vincent 271
- Office Hours: Posted on Dr. Battistini's ASU Faculty Website
  - Mondays 1:00-2:00pm: Virtual Engineering HUB (in Engineering Community on Blackboard)
  - Tuesdays 1:00-2:00pm: Engineering HUB (VIN 254-D)
  - Fridays 9:00-10:00am: VIN 245

3: Course Materials
3.1: Required Textbook
None
3.2: Recommended Textbooks
While there is no required textbook, students are expected to have access to the various civil engineering course materials they have studied as part of their undergraduate degree program, especially in the civil engineering design courses. Students may need access to specific codes and specifications as applicable to the project. The instructor, other faculty, and industry partners will work with the students to help gain access to necessary materials.

3.3: Software
The use of CAD software and other analysis software will be necessary to complete the course project. Students have access to the software through the Engineering Computer Lab (VIN 245) and can access the platform remotely at https://view.angelo.edu.

3.4: Other Supplemental Materials
Materials Posted on Blackboard® Learning Management System

4: Prerequisites
- Senior standing within one semester of graduation
- Departmental permission
5: Course Description

Catalog: Civil Engineering capstone experience. Engineering concepts integrated from topics taught in sequences of upper-division courses to produce practical, efficient and feasible solutions of civil engineering problems. Computer applications are included. Final oral and written reports are required. Intended to be taken in the final semester.

6: Student Learning Outcomes

When you complete this course, you should be able to:

1. Expand knowledge and understanding of civil engineering within the framework of a realistic major design project
2. Advance proficiency with use of specifications, planning and scheduling tools, estimating tools, site investigation techniques, and sustainable design to produce a timely solution
3. Apply geotechnical, structural, hydraulic, transportation, pavement, environmental, and/or materials design to a complex, real-world project satisfying the given constraints
4. Develop an appreciation for the role of professional and ethical responsibility in civil engineering and management practice
5. Develop an organized technical report and oral presentation documenting the project description and proposed solution, which addresses a wide range of audiences
6. Work as a team with other senior engineering students and clients to promote an inclusive environment in which all members’ ideas are heard and valued

7: Course Outcome Mapping

The mapping of the Student Learning Outcomes for the course to the ABET Criterion 3 Student Outcomes is shown in Table 1.

Table 1: Student Learning Outcome Mapping to ABET Criterion 3

<table>
<thead>
<tr>
<th>ABET Criterion 3</th>
<th>Student Learning Outcome Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1. Solve Problems</td>
<td></td>
</tr>
<tr>
<td>2. Design</td>
<td></td>
</tr>
<tr>
<td>3. Communication</td>
<td></td>
</tr>
<tr>
<td>4. Ethics &amp; Professionalism</td>
<td>X</td>
</tr>
<tr>
<td>5. Teamwork</td>
<td></td>
</tr>
<tr>
<td>6. Experimentation</td>
<td></td>
</tr>
<tr>
<td>7. Acquire New Knowledge</td>
<td></td>
</tr>
</tbody>
</table>

8: Course Structure, Communication, Policies

The course will meet once a week for class (Fridays 8:00-8:50am). During the class period, the students will be expected to set an agenda in advance, notify the instructor of the agenda, and conduct a professional business meeting in which the instructor/clients/guests are updated on the progress of the project. While all design groups may not need to provide an update every week, it is expected that each student will present a few times throughout the semester. The instructor may request time at this meeting to provide additional information or to cover select topics. All students are expected to attend weekly and to participate.
The project time for the course (Fridays 1:00-4:50pm) will be used by the students to complete the requirements for the design project. The instructor may opt to use some of this time to cover select topics with either individual design groups or the entire project team. It is expected that you are available to meet during this time.

Attendance (physical or virtual) during the previously described class times and project times is required. Any lesson materials will be added using the Blackboard website for the course. Important course announcements and changes will be sent by email via Blackboard. Students are expected to regularly check their Angelo State University email for these messages.

Academic integrity is expected from all students at all times in accordance with Part I, Section B.1 of the Angelo State University Code of Student Conduct.

Respect for your fellow classmates is required.

9: Professionalism
Professional engineering standard 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;
9. recognize the classroom as a professional workplace.

10: Graded Material

10.1: Final Grades

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance/Participation/Timeliness</td>
<td>10%</td>
</tr>
<tr>
<td>Engineering Notebook</td>
<td>10%</td>
</tr>
<tr>
<td>Project Meetings</td>
<td>10%</td>
</tr>
<tr>
<td>Scope Determination</td>
<td>10%</td>
</tr>
<tr>
<td>Options Analysis</td>
<td>10%</td>
</tr>
<tr>
<td>Final Report</td>
<td>30%</td>
</tr>
<tr>
<td>Final Presentation</td>
<td>20%</td>
</tr>
</tbody>
</table>

Grades resulting from activities requiring group effort are subject to adjustments based on peer evaluations and instructor observations. Therefore, not everyone on a particular team may receive the same grade for the work performed.

10.2: Grading Scale

<table>
<thead>
<tr>
<th>Percentage Interval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.0% - 100%</td>
<td>A</td>
</tr>
<tr>
<td>80.0% - 89.9%</td>
<td>B</td>
</tr>
<tr>
<td>70.0% - 79.9%</td>
<td>C</td>
</tr>
<tr>
<td>60.0% - 69.9%</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 60.0%</td>
<td>F</td>
</tr>
</tbody>
</table>
10.3: **Class Attendance, Participation, Timeliness, and Teamwork**

- A portion of your grade will be based on class participation. For full credit, students are expected to arrive to class on time and adequately prepared, meaning that any assigned work is completed by the time the class period begins.
- Points will be assigned at the discretion of the instructor, and may be based upon the following:
  - Attendance throughout the class period
  - Effort displayed during group presentations
  - Communication or lack of communication with project team
- If you will be absent, please make prior arrangements with the instructor.
- If you are sick, are quarantining, have been exposed to COVID-19, or just feel you should not attend class for your health and/or the health of others, you must contact the instructor and student project manager prior to class. When necessary, the project meeting can be livestreamed via the CENG 4380 Course Room in Blackboard Collaborate.

10.4: **Engineering Notebook**

- As you transition into your engineering career, you will need to be able to track your time on various aspects of different projects you work on in order to properly bill your clients. Additionally, the ability to estimate the time needed for these different aspects is a skill needed to become a project manager.
- For this class, you will need to submit a weekly log of your time as a .pdf. The log must include pertinent details like the engineering activity performed, length of time spent, and others you worked with to complete the task. You can also use this log as a place to keep notes, questions and to explore different design solutions.
- The log will be submitted individually on Blackboard.

10.5: **Project Meetings**

- Your project team will receive a weekly grade for the quality of the meeting agenda, presentation slides, and ability to stay on schedule.

10.6: **Scope Determination**

- Your project team will submit a preliminary report and presentation outlining the current site details and the proposed project scope. This report will be submitted to the client and instructor for review and is subject to modification.
- The report/presentation should include the following:
  - Overall description of project
  - Current site requirements
  - Constraints
  - Assumptions
  - Specifications
  - Deliverables
  - Timeline

10.7: **Options Analysis**

- Your project team must consider at least three alternative design options for the project. The team will study each option and present the benefits and negative impacts of each option to the client. The team should use a decision matrix to rank the options.
- The team will submit an options analysis report and a presentation to the client and instructor.
- The client will have the opportunity to select the desired option along and to request any reasonable modifications.

### 10.8: Final Report / Presentation

- The final written report, complete with CAD drawings and engineering design calculations is due in electronic format, one week prior to the Final Presentation, currently Friday, November 13.
- In accordance with the Angelo State University Final Exam Schedule, the final exam period on Friday, November 20 from 8:00-10:00am will be used for the Final Presentation to the client, faculty, local engineers, alumni, students, and other department guests. Logistical details to be determined.

### 11: Classroom and University Policies and Student Support

#### 11.1: General Policies

All students are required to follow the policies and procedures presented in the Angelo State University Student Handbook and Angelo State University Catalog.

#### 11.2: Required Use of Masks/Facial Coverings by Students in Class

As a member of the Texas Tech University System, Angelo State University has adopted the mandatory Facial Covering Policy to ensure a safe and healthy classroom experience. Current research on the COVID-19 virus suggests there is a significant reduction in the potential for transmission of the virus from person to person by wearing a mask/facial covering that covers the nose and mouth areas. Therefore, in compliance with the university policy, students in this class are required to wear a mask/facial covering before, during, and after class. Faculty members may also ask you to display your daily screening badge as a prerequisite to enter the classroom. You are also asked to maintain safe distancing practices to the best of your ability. For the safety of everyone, any student not appropriately wearing a mask/facial covering will be asked to leave the classroom immediately. The student will be responsible to make up any missed class content or work. Continued non-compliance with the Texas Tech University System Policy may result in disciplinary action through the Office of Student Conduct.

#### 11.3: 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.

The Office of Student Affairs is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student’s responsibility to initiate such a request by contacting Ms. Dallas Swafford, Director of Student Disability Services, at 325-942-2047 or Dallas.Swafford@angelo.edu, or visit the Student Disabilities Services Website.

#### 11.4: Title IX Statement

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.

As a faculty member, I am a Responsible Employee meaning that I will report any allegations I am notified of to the Office of Title IX Compliance in order to connect students with resources and options in addressing the allegations reported. You are also encouraged to report any incidents involving yourself or someone you know to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator. You may do so by contacting:

Michelle Boone, J.D., Director of Title IX Compliance by calling 325-942-2022, by emailing Michelle.Boone@angelo.edu, or by visiting the Mayer Administration Building, Room 210.

You may also file an incident report anonymously online anytime using the ASU Incident Report Form.

If you are wishing to speak to someone about an incident in confidence you may contact the University Health Clinic and Counseling Center at 325-942-2371 or the ASU Crisis Helpline at 325-486-6345.

The Office of Title IX Compliance also provides accommodations related to pregnancy (such as communicating with your professors regarding medically necessary absences, modifications required because of pregnancy, etc.). If you are pregnant and need assistance or accommodations, please contact the Office of Title IX Compliance utilizing the information above.

For additional information, visit ASU’s Title IX website.

11.5: 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 for more information.

11.6: 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.

11.7: Student Conduct Policies

11.7.1: 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 Statement of Academic Integrity.

11.7.2: 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. Resources to help you understand this policy better are available at the ASU Writing Center\textsuperscript{13}.

11.7.3: 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.

12: Instructor Prerogative

The instructor reserves the right to change the policies and procedures of this course when he deems it necessary. Any such changes will be implemented fairly and will typically not be a detriment to your grade. The instructor will notify you of any such changes in a timely manner.

12.1: Diversity and Equity Statement

The instructor strives to promote a living and learning environment for outstanding growth and productivity among all students, faculty and staff. Diversity is broadly defined to include such characteristics as, but not limited to, race, ethnicity, gender, religion, age, disability, sexual orientation, or socio-economic background. Diversity also entails different viewpoints, philosophies, and perspectives. Course activities and attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard and respected. All students in my classroom are expected to show respect for one another.
13: Course Outline

The course outline is presented in Table 2. Updates to this schedule will be provided via Blackboard.

Table 2: Course Outline

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Notes/Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Friday</td>
<td>8/21</td>
<td>Project Introduction by Client: 8:00-8:50am; Site Visit with Client and Instructor: 1:30pm-??</td>
</tr>
<tr>
<td>02</td>
<td>Friday</td>
<td>8/28</td>
<td>Team Meeting: Project Scope Determination; Gantt Charts</td>
</tr>
<tr>
<td></td>
<td>Thursday</td>
<td>9/3</td>
<td>SCOPE DETERMINATION: REPORT DUE BY 3:00PM</td>
</tr>
<tr>
<td>03</td>
<td>Friday</td>
<td>9/4</td>
<td>SCOPE DETERMINATION: PRESENTATION TO CLIENT, TBD</td>
</tr>
<tr>
<td>04</td>
<td>Friday</td>
<td>9/11</td>
<td>Team Meeting: Options Analysis; Decision Matrix</td>
</tr>
<tr>
<td></td>
<td>Thursday</td>
<td>9/17</td>
<td>OPTIONS ANALYSIS: REPORT DUE BY 3:00PM</td>
</tr>
<tr>
<td>05</td>
<td>Friday</td>
<td>9/18</td>
<td>OPTIONS ANALYSIS: PRESENTATION TO CLIENT, TBD</td>
</tr>
<tr>
<td>06</td>
<td>Friday</td>
<td>9/25</td>
<td>Team Meeting: Agenda TBD</td>
</tr>
<tr>
<td>07</td>
<td>Friday</td>
<td>10/2</td>
<td>Team Meeting: Agenda TBD</td>
</tr>
<tr>
<td>08</td>
<td>Friday</td>
<td>10/9</td>
<td>Team Meeting: Agenda TBD</td>
</tr>
<tr>
<td>09</td>
<td>Friday</td>
<td>10/16</td>
<td>Team Meeting: Agenda TBD</td>
</tr>
<tr>
<td>10</td>
<td>Friday</td>
<td>10/23</td>
<td>Team Meeting: Agenda TBD</td>
</tr>
<tr>
<td>11</td>
<td>Friday</td>
<td>10/30</td>
<td>Team Meeting: Agenda TBD</td>
</tr>
<tr>
<td>12</td>
<td>Friday</td>
<td>11/6</td>
<td>Team Meeting: Agenda TBD</td>
</tr>
<tr>
<td>13</td>
<td>Friday</td>
<td>11/13</td>
<td>FINAL REPORT DUE BY 5:00PM</td>
</tr>
<tr>
<td>14</td>
<td>Friday</td>
<td>11/20</td>
<td>FINAL PRESENTATION 8:00-10:00AM</td>
</tr>
</tbody>
</table>
14: End Notes: Complete Hyperlinks From Syllabus

1 http://www.angelo.edu/content/profiles/6463-anthony-d-battistini
2 https://blackboard.angelo.edu/
4 https://www.angelo.edu/services/registrars_office/final.php
5 http://www.angel.edu/student-handbook/
6 http://www.angelo.edu/catalogs/
7 http://www.angelo.edu/services/disability-services/
8 https://cm.maxient.com/reportingform.php?AngeloStateUniv&layout_id=1
9 https://www.angelo.edu/services/title-ix/
10 http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of
11 http://www.angelo.edu/content/files/14197-op-1011-grading-procedures
12 http://www.angelo.edu/student-handbook/community-policies/academic-integrity.php
13 http://www.angelo.edu/dept/writing_center/academic_honesty.php