

CE 4188: Senior Design I

Department of Civil Engineering

General Information

Instructors: Jeffrey Weidner, Ph.D.
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Office Hours: Monday 1:00 PM to 3:00PM or by appointment via email

Meeting Time and Location: Friday: Business Building 331 - 8:30AM to 9:20AM
CCSB 0208B (For joint classes with CE 4288)

Final Exam: None

Course Description: ABET Requirements:
Students must be prepared for engineering practice through a curriculum culminating in a **major design experience** based on the **knowledge and skills acquired in earlier course work** and incorporating **appropriate engineering standards** and **multiple realistic constraints**.

Expectations: Instructor Expectations: From us you can expect the following:

- We will treat all teams and individuals respectfully and equitably
- We will adhere to this syllabus
- We will assign you the grade that you earn
- We will provide minor instruction on very specific topics as needed
- We will provide access to resources to support your project through the Resource Library
- We will not teach material that should have been covered in a prior course, regardless of how well you felt it was taught, or how well you learned it
- We will make ourselves available to attempt to address issues that may arise via office hours appointments
- I (Dr. Weidner) will respond in a timely fashion (within 12 hours generally) to emails and Slack messages (if you elect to use Slack)

- We will not be expected to reply to students immediately

Student Expectations: From you we expect the following:

- You will treat us, the other teams, and your teammates with respect
- You will act in a professional manner at all times
- You will adhere to this syllabus and to your team agreement
- You will apply the knowledge to which you previously should have been exposed.
- You will work to learn new skills as needed in a self-guided manner.
- You will treat our time as valuable, scheduling meetings in advance and coming prepared to ask questions and present proposed solutions
- You will take personal responsibility for the success of your project
- You will adhere to the guidance provided on Blackboard for interacting with mentors
- For your initial mentor meeting, you will provide an agenda to us prior to your meeting.

Class
Approach:

Projects and Team Formation: This term a selection of project options will be presented on the first day of class. You will, as individuals, rank these projects by your interest level. We will form teams out of the rankings prior to the second class. Teams will be at most six or as few as four students. No more than two teams may work on a specific project.

Each project was brought forth by a sponsor from local industry or government. This sponsor will serve in a mentor role while also wearing the hat of the client. Since we are taking on several independent projects, the depth and challenges for each project will vary. Some projects will be more focused on structural design, while others may focus more on geotechnical or environmental issues. Please consider this in your ranking.

We have a unique opportunity this term to include aspects of innovation in our project as part of the Venturewell Grant Dr. Raheem won. Teams with interest in participating in Venturewell will have access to travel funding and other opportunities that will augment the senior design experience.

Teamwork: In order to meet ABET requirements, Senior Design should prepare you for engineering practice. Unless you are practicing as an engineer on your own (which is impossible prior to full licensure), you will be working in teams. Working successfully in a collaborative environment requires trust and patience in the face of pressure and time constraints. To encourage you explore and understand this dynamic, your deliverables will be graded as a team, not on an individual basis. That said, we understand that it is not uncommon for some team members to carry more of the load than others. This is a graded assignment that reflects personally on your individual performances within your team. As such, there will be a peer evaluation to reflect on each individual's performance within your team, including your own.

To provide context for these peer evaluations, you will be required to create and sign a team agreement. This agreement will specifically address the following items:

- Scheduled meeting times
- Communication plans
- Resource plan
- Documentation plan
- Grievance plan

This agreement and the products from it should be available to us if we feel they are required to address any issues that arise.

We will utilize Blackboard as a file repository for the class.

Deliverables: There are three primary deliverables for this class which will be graded. They are the progress report, site plan, and progress presentation. Each primary deliverable will have interim deliverables, as described in Table 1 below. **You are responsible, as a team, for providing a schedule for submission of those interim deliverables. Your submission of these interim deliverables in a timely fashion will factor into the grading of your final product, but the interim deliverables will not be graded independently.** We will evaluate your interim deliverables and provide feedback in as timely a fashion as possible. In the middle of the term, you will turn in a midterm progress report which we will evaluate and will include in your grade.

Not all deliverables are relevant for every team because of the variation in the types and scopes of your projects. We will work on a team to team basis to finalize the deliverable list. Professionalism and appearance are important to deliverables but will only be evaluated as part of the end-of-term submission. When assumptions are required, they must be clearly stated and justified in your final deliverables.

Lecture Periods: The purpose of our lecture period is, first and foremost, an opportunity for us to interact and address issues that are arising within your team and your project. We will not take attendance, but we suggest that as part of the documentation plan that notes are taken for each lecture, including team attendance. If you do not attend lecture it is between you and your group to work out, and we expect the results of that to come to bear in the peer evaluations.

We will use lectures, on occasion, to present material that we believe will be beneficial for your project, or we will bring in guest speakers. Anticipated topics include:

- Using Microsoft Word effectively to create a document
- Developing a building program and requirements
- Understanding engineering drawings

- Professionalism
- Reviewing Past Senior Design Projects

As indicated by the ABET description, your design should be based on your knowledge and skills acquired in prior courses. We understand and hereby recognize that you have not learned everything in prior courses that you need to complete this design. **You are expected to bridge that gap yourself by seeking out resources and guidance.** See the resource library section for additional information.

Resource Library: To help bridge the gap between your existing coursework and the specific design challenges you are facing with this project, we have created a resource library on Blackboard. Here you will find information about design codes and specifications, software resources, textbooks, and local engineers who may be willing to serve as a mentor or advisor. There is guidance for citing references and resources of which you may use.

Table 1 – Example Deliverable Table

Design Category	Deliverable	Date of Submission
Overall	Site plan	
Architecture	Occupancy and egress assessment	
	Floor plan	
	Section with floor/façade detail	
Structure	Structural form selection	
	Load determination - vertical	
	Load determination - lateral	
	Structural design calculations	
	Structural drawings	
Foundation / Geotechnical	Soil Information and Profile	
	Foundation system selection	
	Foundation design calculations	
	Foundation plan	
	Foundation elevation	
Transportation	Trip generation analysis	
	Level of Service analysis	
	Design of improvements	
	Multimodal transportation plan	
Environmental	Stormwater management	
	Sustainability plan	
	Green infrastructure	
Construction Management	Final schedule	
	Final cost estimate	

- Course Objectives: By the end of this course you should:
1. Describe the design process for a realistic civil engineering project.
 2. Produce professional quality engineering drawings
 3. Produce a professional quality engineering report
 4. Produce representative professional quality design calculations
 5. Demonstrate professional quality presentation skills
 6. Use engineering software tools to aid in civil engineering design
 7. Interact with local practitioners to get mentoring and support
 8. Describe the role of sustainability in civil engineering design

Class Policies

Honor Code: Students are expected to adhere to the Honor Code of the Department of Civil Engineering, which can be found here (<http://ce.utep.edu/honorcode.htm>). Instances of suspected cheating or other violations of the Honor Code will be handled according to the procedures in the UTEP Handbook of Procedures. Under no circumstances should any design work be completed by anyone outside of your team. Additionally, under no circumstances should a practicing mentor be compensated for their time or assistance.

Attendance Policy: We do not take attendance during class.

Neatness Policy: By this stage in your educational career, you should be submitting work that is neat and professional. We reserve the right to return work unreviewed if we deem it unprofessional. Resubmitted work will be considered late.

Coursework and Grading Expectations

Grading: Grade Breakdown:

Midterm Evaluation:	20%
Progress Presentation:	20%
Progress Report:	20%
Site Plan:	20%
Peer Assessment:	20%

Final Grade Thresholds: $A \geq 89.5$
 $89.5 > B \geq 79.5$
 $79.5 > C \geq 69.5$
 $69.5 > D \geq 59.5$
 $59.5 > F$

Exams: There are no exams in this course.

Homework: There is no homework in this course.