Exploring Civil and Environmental Engineering

School of Civil and Environmental Engineering

Syllabus, CEE 2812, Fall 2023

Lecture: Tuesday 12:30-1:20pm
Location: Kendeda 230
Studio A01: F 3:30-5:25pm
Location: Mason 2117
Studio A02: R 3:30-5:25pm
Location: Ford ES&T L1105

Instructors:
Dr. Kevin Haas
Office Hours: Wednesday 3pm-4pm or by appointment
Mason 2231
Email: kevin.haas@ce.gatech.edu

Dr. Jen Kaiser
Office Hours: Mondays 9am-10am or by appointment
Ford ES&T 3224
Email: jennifer.kaiser@ce.gatech.edu

Teaching Assistant:
Binod Yadav
Email: byadav7@gatech.edu

Quick References

Course website: Canvas: https://gatech.instructure.com/courses/332264

Important dates:

- Field trip: 12/13 October (during studio class period; details to follow)
- Due dates: Assignments are due online through the course website by the beginning of the class session on the day they are due (generally Tuesdays).
  There is no final exam in this class. Your final assignment will be due by the end of our final exam slot, 2:10 pm on 14 December 2023.
- No classes: 10 October 2023, 23/24 November 2023
- Withdrawal/grade mode/grade substitution deadline: 28 October 2023

Texts and other resources: There is no textbook for this class. Readings will be available either freely or through Georgia Tech's online library resources. **Please bring your laptop to class to enhance participation.**

Prerequisites: Instructor approval; first-year status; CEE majors.

Accommodation of Special Circumstances.
Staying Healthy The expectation for this class is that we will do what we can to keep our community safe, together. Our goal is to try to be flexible, fair, and helpful, and we ask your understanding if we need some flexibility from you as well. If you are sick, you may participate in the class remotely using the Zoom link on Canvas.

General Please inform the instructor in writing in the first two weeks of the semester regarding academic accommodation of disabilities, religious beliefs, or other circumstances (see also Page 7).

About the Class

Welcome to the School of Civil and Environmental Engineering at Georgia Tech! “Exploring Civil and Environmental Engineering” is a course designed for new CEE students as you explore the field of civil and environmental engineering. This class will help you build the first chapter in the story of your higher education and career.

Together, we will ask **what** civil and environmental engineers do. CEE is about designing, implementing, and maintaining the systems and structures of human life, from bridges and buildings to sustainability and decision-making strategies. In this class, you’ll engage with some of the major topics of our profession: sustainable systems, smart cities, healthy communities, and resilient infrastructure. Engineering is about solving problems, design that improves people’s lives, and leadership, so we will also ask **how** civil and environmental engineers work. This course will introduce you to some of the fundamental tools and approaches used by civil and environmental engineers from across the discipline, including from groups in our School: construction and infrastructure systems engineering; environmental engineering; geosystems engineering; structural engineering, mechanics, and materials; transportation systems engineering; and water resources engineering.

The main goal of this class is to give you opportunities to understand civil and environmental engineering issues in context, then practice using tools and strategies that you’ll become more familiar with over the next several years. We will use real and hypothetical scenarios for assignments and in-class activities. We will also engage directly with the practice of CEE through a campus field trip and speakers who have professionally addressed some of the issues we’ll talk about.

Course Objectives: What Will You Learn in This Class?

We are very excited that you are at Georgia Tech and are interested in Civil and Environmental Engineering, where we think about societal-scale systems, the human-built environment-natural environment interface, and the kinds of “wicked problems” that require multidisciplinary problem solving and leadership. CEE has designed this class with the goal of helping you become engaged members of the CEE community, with a sense of what that might mean for you. Specifically, we have several learning objectives:

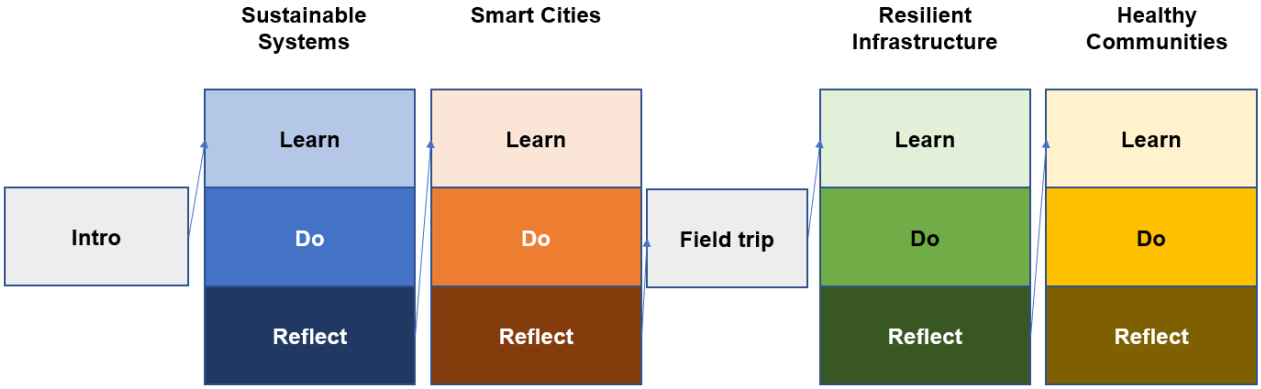
1) We hope that this class helps you understand both what civil and environmental engineers do and develop a personal connection to CEE practice;
2) We will ask you to start learning the language and practicing the basic tools of CEE, including problem scoping, scenario analysis, common calculations, and communicating your thought process and experiences in writing;
3) We expect you will become familiar with the types of infrastructure, design considerations, ethical considerations, and social, environmental, and cost constraints commonly encountered in CEE and learn how CEE engineers create value for society through their work;
4) We expect you will develop the ability to think critically about CEE-style problems, drawing on experience you will gain by actively thinking through and observing challenges;
5) We expect that this class will build your curiosity for the profession, such that you will know where to go for more information and will have a better sense of the kinds of classes you might be interested in, the kinds of jobs you will be able to do with a CEE degree, and the kinds of problems you are interested in working on.

Course Structure

In this course, we'll be thinking about CEE through the lens of four big ideas: 1) Sustainable systems; 2) Smart cities; 3) Resilient infrastructure; and 4) Healthy communities. We'll also be thinking about how civil and environmental engineers address these problems across our School and profession, using tools from our groups: a) Construction and Infrastructure Systems Engineering; b) Environmental Engineering; c) Geosystems Engineering; d) Structural Engineering, Mechanics, and Materials; e) Transportation Systems Engineering; and f) Water Resources Engineering. You'll have the opportunity to work by yourself and with your peers, with the overall goal of giving you a chance to think about a problem on your own, bring those thoughts together with a few other people in a small group, and then reflect on the experience for each of our four big topics.

We will meet for a joint lecture one day a week for 50 minutes and have separate studio sections for nearly two hours. We will include interactive work together along with guest speakers from our School and practitioners in the field. The general pattern is that we will talk about each of our four major CEE focus areas for three weeks. In the first week of each module, we will introduce the topic, discuss some of the terms, strategies, and issues associated with the area, and practice tools civil and environmental engineers use in relation to the topic. Then, you will work on a homework assignment by yourself to get you thinking about the topic. After you turn it in, you will be well equipped to engage with a small group of your peers to do a group assignment in week 2. We'll talk about your project experience and real-world applications related to the area in week 3 of each module, then you'll write an individual reflection.

Here's a map of the course:



**Each individual box represents a week of class*

Meeting schedule

Note: Assignment schedule is final; lecture schedule is subject to minor adjustments based on instructor and guest availability, student interests, and the potential to talk about current events.

Theme	Date	Instructor	Topic	Assignments due (Tuesdays by 12:30 pm unless otherwise noted)
	22 August	Dr. Haas/Dr. Kaiser	Week 1: Introduction to CEE and to the class	none
	24/25 August	Dr. Haas/Dr. Kaiser		
Sustainable Systems	29 August	Dr. Kaiser	Week 2: Topic intro	Goals/intro paragraph
	31 August/1 September	Dr. Kaiser		
	5 September	Dr. Kaiser	Week 3: Group work	Homework 1
	7/8 September	Binod		
	12 September	Dr. Kaiser	Week 4: Topic in practice	Group work 1
	14/15 September	Dr. Haas/Dr. Kaiser		
Smart Cities	19 September	Dr. Haas	Week 5: Topic intro	Reflection 1
	21/22 September	Dr. Kaiser		Scavenger Hunt 1 (**Fri 5pm**)
	26 September	Dr. Haas	Week 6: Group work	Homework 2
	28/29 September	Binod		
	3 October	Dr. Haas	Week 7: Topic in practice	Group work 2
	5/6 October	Dr. Haas		
	10 October		Fall Break/No Class	
	12/13 October	Dr. Haas/Dr. Kaiser	Field Trip	
Resilient Infrastructure	17 October	Dr. Haas	Week 9: Topic intro	Reflection 2
	19/20 October	Dr. Haas		
	24 October	Dr. Haas	Week 10: Group work	Homework 3
	26/27 October	Binod		Scavenger Hunt 2 (**Fri 5pm**)
	31 October	Dr. Haas	Week 11: Topic in practice	Group work 3
	2/3 November	Dr. Haas		
Healthy Communities	7 November	Dr. Kaiser	Week 12: Topic intro	Reflection 3
	9/10 November	Dr. Kaiser		
	14 November	Dr. Kaiser	Week 13: Group work	Homework 4
	16/17 November	Binod		
	21 November	Dr. Kaiser	Week 14: Topic in practice	
	23/24 November		Thanksgiving break/No class	
	28 November	Dr. Kaiser	Week 15: Topic in practice	Group work 4
	30 November/1 December	Dr. Haas/Dr. Kaiser		Reflection 4 (**Friday, 5pm)**
	5 December	Dr. Haas/Dr. Kaiser	Student Panel	Scavenger Hunt 3 (**Mon 5pm**)
	Thursday 14 December		Finals week/No final	Final Reflection **(due 2:10 pm)**

Detailed Class Processes, Assessment, and Evaluation

Grading and expected workload: 2 credit hours, or roughly 6 hours of in- and out-of-class work each week. The exact time commitment might vary from week to week. Final grades are on a letter basis and follow the standard GT scale. Contributions to the course grade are**:**

Homework/Reflections	**50%**
Group Projects	**25%**
Intro Paragraph	**5%**
Attendance Surveys	**5%**
Scavenger Hunt	**10%**
Final Reflection	**5%**

This term we will be using Piazza for class discussion: for class topics, we will check Piazza more consistently than email, so please try Piazza first if you have a question. You and your classmates can answer Piazza questions too, so Piazza is almost always the fastest way to get what you need. You may post without your name visible, and if you have a specific question you only want us to see, you can post to "Instructors" to send a private message. The class Piazza page is accessible directly through Canvas (see the sidebar).

In general, assignments are due online at the beginning of class on the day that they are due, commonly this is Tuesday each week (specific due dates are in the table above). We will drop your lowest score for one Homework **or** Reflection—if you don't or can't turn in an assignment one week, it will count as your lowest score, so there is no need to contact us. Group assignments, the scavenger hunt, and your intro and final reflection cannot be dropped. If you have a major multi-week issue preventing you from participating and completing assignments (e.g., long-term hospital stay), please contact us and we can talk through options for makeup assignments and excused absences.

Typically, **we do not accept late assignments**. There are two major reasons for this policy. First, we generally post homework solutions immediately after each homework assignment is due so that you will be able to learn from and apply the concepts to the next assignment, which is a group project using some of the same concepts. Second, we are committed to returning your assignments within a week of the due date and need time to grade them. It is your responsibility to make sure that assignments have been received and graded: please report any ungraded/missing assignments no later than ten days after assignments are returned to students.

Grading note:
Georgia Tech does not use a +/- grading system: that is, letter grades are assigned as A (90-100%), B (80-89%), C (70-79%), D (60-69%), or F (<60%). We will round up in this class (e.g., a 79.5% average is a B, but a 79.4% is a C). Thus, using the weighting information below, you should be able to calculate your minimum grade at any time. If you are concerned or have questions, please come talk to me in office hours during the semester. Once grades are posted, we will not change them except in the case of a mathematical error.

Goals and introduction paragraph:

Due Tuesday of Week 2, online at the beginning of class: Please submit 1 paragraph (no less than 100 and no more than 300 words) explaining your goals and expectations for the class, your time in CEE at Georgia Tech, and what you think you might like to do when you graduate. Don't worry if you don't know yet—this is mostly to help us get a sense for who you are and what you hope to learn, so we can adapt the class to our group.

Homework:

Due Tuesday of Weeks 3, 6, 10, 13, online at the beginning of class: You will have four individual homework assignments. Homeworks will be a mix of quantitative and qualitative work, and you are welcome to collaborate with peers. However, each student is expected to turn in an individual assignment in your own words: plagiarism or copying is a serious violation of the Honor Code. We will drop your lowest score out of the 8 Homeworks and Reflections.

Projects:

Due Tuesday of Weeks 4, 7, 11, 15, online at the beginning of class: You will have four group assignments. You will start work on these projects in class, and you will work with a different assigned group for each module. The goal of project work is collaboration: each group will turn in a single assignment, either in the form of a PowerPoint presentation (Weeks 4 and 11) or short written report (Weeks 7 and 15). In Weeks 4 and 15, groups will be asked to present their presentations. Grades will be based on submitted PowerPoints and whether you participated, not the presentation itself. More details will be distributed in class. Rubrics will be posted on Canvas.

Reflections:

Due Tuesday of Weeks 5, 9 and 12, and Friday of Week 15 (due to break), online at the beginning of class: Writing is a major tool that you will use in this class and beyond to communicate how you are thinking about an issue, how you approached a challenge, and what you will do differently next time. As part of this class, you will submit four reflections on your experiences with our topics, roughly every three weeks. These assignments are individual: although you can discuss with peers, please do not collaborate on the reflections themselves. Expectations will be discussed further in class, and a rubric will be posted to Canvas. We will drop your lowest score out of the 8 Homeworks and Reflections

Attendance and participation:

This course involves significant teamwork with your classmates. Accordingly, attendance is required, and you are expected to stay in class and participate in activities. Attending class meetings will be assessed with a survey question made available on Canvas for a random short period of time during each class meeting. Full participation credit for a class meeting will be awarded for providing a response. The lowest attendance grade will be dropped (i.e., you can have an unexcused absence with no penalty).

Excused absences are verified through the Class Absence Verification Form, available through the Office of Student Life (https://studentlife.gatech.edu/resources/class-attendance). Dean of Students staff members do not write "excuses" for routine class absences, nor does any other office/person on campus. The Dean of Students Office will, however, notify faculty members in cases of hospitalizations, accidents, family emergencies, and lengthy illnesses AND when the student is unable to communicate directly with their faculty member(s). Students who find it necessary to be absent for short periods of time should email instructors in advance, or as soon as they are able.

Scavenger hunt assignment:

Due on Fridays at 5pm of Weeks 5 and 10, and 5pm the last Monday of class: You will be completing a scavenger hunt assignment over the course of the semester. Details to follow in class.

Accessibility and Support

If you are a student with learning needs that may require special accommodation, contact the Office of Disability Services at (404) 894-2563 or http://disabilityservices.gatech.edu/, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

If you are interested in campus support services not associated with a documented disability, take a look at academic resources (success.gatech.edu, advising.gatech.edu, library.gatech.edu); community services (omed.gatech.edu, studentlife.gatech.edu); and health and wellness resources (counseling.gatech.edu, health.gatech.edu). If you need help or want to talk through options, please talk to me and I will try to help you.

Honor Code and Expectations Agreement

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. The Honor Code applies to all members of our community, including me as your professor. We agree: "I commit to uphold the ideals of honor and integrity by refusing to betray the trust bestowed upon me as a member of the Georgia Tech community." You can read the full Honor Code here: http://www.policylibrary.gatech.edu/student-affairs/academic-honor-code/.

As the Honor Code notes, as your professor, I commit to "creat[ing] an environment where honesty flourishes." To maintain fairness and uphold our professional standards as engineers and engineering trainees, any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations. In general, collaboration on homework assignments is allowed and encouraged, but you are required to turn in your own work. Exceptions to the collaboration rule (for example, for personal reflections) will be clarified in class.

At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See http://www.catalog.gatech.edu/rules/22/ for an articulation of some basic expectations that you can have of us and that we have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, we encourage you to remain committed to the ideals of Georgia Tech while in this class.