CEE 4090A & CEE4090B Capstone Design

Capstone Design
Section A – Civil
Section B – Environmental
Fall 2026

Instructor Information

Table 1 - Engineering Faculty Advisors

Prof. Sharon Just, PE Section B (ENV) Lead Environmental Projects Faculty Advisor **sharon.just@gatech.edu**	**Dr. Fred Meyer, PE** Section A (CIV) Lead Structural Projects Faculty Advisor **fred.meyer@gatech.edu**
Dr. Joe Manous, PE Civil Projects Faculty Advisor **joe.manous@ce.gatech.edu**	**Dr. Georgene Geary, PE** Transportation Projects Faculty Advisor **ggeary@gatech.edu**

Table 2 – Communication and Teamwork Advisors

Dr. Olga Menagarishvili Engineering Communication **olga.menagarishvili@ce.gatech.edu**	**Dr. Chris Martin** Collaborative Innovation **chris.martin@ce.gatech.edu**

Additional instructors are on call for other expertise such as CAD; see canvas resource guide.

General Course Information

Description

Capstone Design is an interdisciplinary civil and environmental design experience.

On the first day of class, professors will present information on available projects, in categories such as:

- ENV – Air, Water, Wastewater, Stormwater, Soil, Groundwater, Leachate
- CIV – Civil (Geotech, Hydrology, Land Development, Construction Management)
- STRUCT – Buildings & Bridges
- TRANSP – Civil (Transportation)

After the projects are described, students will have time at the end of the first day of class to meet other students and organize into teams. Teams will consist of four students unless otherwise approved by the instructor team. Historically, this means most students are on teams of four, with a few students on teams of three as/if needed to evenly divide the class based on enrollment. Students will submit their desired teammates, and professors will set-up the teams based on the lists and other factors.

These teams function as "companies" that provide consulting services to a selected sponsor ("client") on a specific design project. Students go through the stages of problem definition, data acquisition, and evaluation of design alternatives. The course culminates in a written report and oral presentation of the final design to the client with the lead instructor in attendance.

Students register for the class based on their major (A for Civil majors, B for Environmental majors), but weekly meetings with faculty mentors are based on the type of project, with general match-ups as follows: Dr. Meyer (STRUCT), Dr. Manous (CIV), Dr. Geary (TRANSP), and Prof. Just (ENV).

Course Learning Outcomes

Outcome 1: An ability to identify, formulate, and solve complex engineering problems.

Outcome 2: An ability to apply engineering design to produce solutions.

Outcome 3: An ability to communicate effectively.

Outcome 4: An ability to recognize ethical and professional responsibilities.

Outcome 5: An ability to function effectively on a team.

Outcome 6: An ability to acquire and apply new knowledge.

Required Course Materials

Students are not required to purchase any textbooks for the class. A resource guide is posted to canvas to document library references (such as RS Means), other cost data (such as GDOT pricing), CAD training, software licenses, and similar resources. In addition, faculty members mentor students regarding guidance pertinent to their specific projects, such as the free, on-line Georgia Stormwater Management Manual (GSMM) for stormwater projects.

Grading Policy:

The following submittals are required:

<u>Letter Proposal (10% of grade)</u> – Each team will select their top 3 desired projects and prepare a letter proposal in the following format: transmittal letter (1 pg), technical approach/scope (2 pg x 3 projects = 6 pg), budget/timeline/personnel list (1 pg), resumes/bios (1 pg x 4 people = 4 pg), ranked list of 8 projects (1 pg), and references. See instructions.

The letter proposal will be reviewed by all faculty advisor PEs and the engineering communication professor and receive an overall grade (averaged from all reviewers) as to the quality of the proposal. Teams will be matched to projects based on proposal quality, faculty assessment of best talent match-up based on the proposals, client balancing, and team project preferences.

Client Intro Email and Kick-Off Meeting (feedback only) - Each team will select a team leader, prepare an introduction email to the client, attend a kick-off meeting (zoom or in person, coordinated with the faculty advisor and client), and organize an initial site visit.

Midterm Presentation (feedback only) - After assessing available data and performing the site visit, each team will present a 6 to 7 minute long midterm presentation to the class. All team members are expected to speak, but they do not need to speak equal amounts of time. Q&A will follow, with questions from other students, the faculty advisors, and/or the technical communications lead. Informal feedback is provided on the midterm presentation from the faculty present.

Final Design Report and Presentation (90% of grade) – At the end of the semester, each student group is required to prepare a final written report (including calculations, design drawings, and uploads to Canvas of all related modeling and other files) and to make a final oral presentation to the sponsor (with all team members having a presentation part, and with at least one faculty advisor in attendance). The meetings are often scheduled for 1 hour, but this includes time for introductions, presentation, Q&A, and closeout. The presentation itself is typically 20 minutes, though occasionally 30 minutes. Some clients may impose time requirements such as a 15-minute lunch & learn session.

Projects will be graded by the faculty advisor, client sponsor, and one additional faculty reviewer. Refer to the capstone assessment plan for details.

Other Activities (GAWP, EXPO) – Where possible, teams with water, wastewater, or circular economy topics are strongly encouraged to participate in the Georgia Association of Water Professionals (GAWP) student design competition (SDC), which provides an opportunity to have a SDC presentation/paper and offers opportunities to win awards at state and national/international level.

All capstone teams are also encouraged to participate in the GT Capstone Expo. Teams can compete at both Expo and GAWP.

Debriefing Reports (required) - At the conclusion of the semester, a debriefing module will be posted with information regarding the following. Each student is ***individually required*** to provide a synopsis of your experiences, both corporately and individually, including:

- Assessment/reflection memo (public)
- Assessment/reflection memo (private)
- ABET self-assessment

See canvas *CEE 4090-Student-Reflection-and-Closeout-Instructions* for details.

In addition, the student team project manager is required to provide an acknowledgements list (including names/roles and emails for all client contacts, GT faculty, grad students, etc. who provided advice). This documents faculty involvement and aids in thanking sponsors. Canvas reminders will be sent for all required submittals.

Description of Graded Components

An ABET-based scoring sheet has been developed that is used by client sponsors, faculty reviewers, and for the self-assessment.

Team Grades: The team grade may be adjusted by the instructors based on factors such as the strictness of the client sponsor reviewer, whether the client sponsor and faculty ratings diverge, if unusual project challenges were encountered, and other factors.

Individual Grades: Professors will make final adjustments to individual grades that may differ from the team grade (up or down) based on each student's participation/ contribution, as observed in weekly meetings with the professor and as assessed by teammates in the debriefing reports.

Course Policies

Attendance and/or Participation

Students are expected to attend class-wide lectures which occur on specified dates at the beginning of class in a combined lecture hall, as well as attend weekly meetings with their faculty mentor, weekly meetings with their client sponsor, and team meetings as needed to complete their projects. If you are sick, please arrange to get information from your group and contact your lead instructor.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct.

Any student suspected of cheating or plagiarism 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.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) 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.

Student-Faculty Expectations Agreement

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. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Pre- &/or Co-Requisites

Permits are required to schedule capstone; contact undergraduate advising to do so.

Collaboration, Group Work, and Use of Generative AI

All interactions both within groups and with outsiders should comply with the highest ethical standards. Citations must be properly made, and each team should include an acknowledgements section to credit people used for consultation. Cheating or plagiarizing will be addressed by the instructors and/or the Office of Student Integrity.

- Students are permitted and encouraged to work together without limit.
- Individuals and groups may consult with any individuals and organizations that they deem appropriate, with the exception of GT faculty not assigned as instructors for this class.
- Requests for consultation with other GT faculty should be made through and will be coordinated by the instructor(s).

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

Late submittals of the qualifications statement will impact both the grade and the project assigned. Incomplete final reports will detrimentally impact the group grade.

Inclement Weather and Digital Learning Days

When needed for campus emergencies, zoom or similar calls platforms may be used to complete team meetings.

Student Use of Mobile Devices in the Classroom

During class lectures, mobile devices should be stored to provide full attention on the speaker.

Campus Resources for Students

Undergraduate Student Academic Success Resources:

- Academic Support: Academic Success and Advising (a unit in the Office of Undergraduate Education & Student Success) provides free support for students.
- Students can attend scheduled supplemental review (PLUS) sessions, stop by Drop-In Tutoring, or schedule a one-on-one appointment through Knack.
- To explore what options work best for you, please visit success.gatech.edu/tutoring, email tutoring@gatech.edu, or go to the Clough Undergraduate Learning Commons, Suite 283.

Student Well-Being:

At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A comprehensive list of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being (student-resource-guide (gatech.edu)