CEE3090 Data Analytics in CEE Syllabus

Course Information

Instructor: Haiying Huang (haiying.huang@ce.gatech.edu)

Course Prefix and Number: CEE 3090

General Course Information

Description

This course introduces the basics of data analytics applications in civil and environmental engineering. Specific topics include Python basics, accessing and assessing datasets, data visualization and communication, data modeling and statistical inference, and responsible AI tool usage.

Course Learning Outcomes

Upon successful completion of this course, students are expected to be able to,

- Explore, visualize, and analyze data in a reproducible and shareable manner.
- Formulate workflows and develop solutions for problems and case studies inspired by and based on civil and environmental engineering applications.
- Responsibly leverage AI tools within data analytics workflows while critically assessing the validity and potential biases in AI-generated insights.
- Communicate results through written assignments and project presentation effectively.

Required Course Materials

- James, G., Witten, D., Hastie, T. and R. Tibshirani (2023). *An Introduction to Statistical Learning (with Python). https://www.statlearning.com/*
- Lecture and studio supplements will be posted on Canvas.

Grading Policy:

- Exams are closed book/notes and in-person.

HW - 15%, Pop quizzes - 5%, Midterm Exam - 15%, Final Exam 15%
Midterm Project Presentation - 10%, Midterm Project Report - 10%
Final Project Presentation - 10%, Final Project Report - 20%

Final grade will be determined according to:

A ⩾ 90% > B ⩾ 80% > C ⩾ 70% > D ⩾ 60%.

Course Policies

Attendance and/or Participation

Attendance in all lectures and laboratory sessions is mandatory. In accordance with the Institute requirement, verification of participation of the class will be reported to the Registrar's Office and the Office of Scholarships and Financial Aid. Time stamp of your Canvas activities will serve as evidence of class participation.

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.

Core IMPACTS

Core IMPACTS is the University System of Georgia's General Education curriculum. If you are teaching a course that counts towards Core IMPACTS, you should include a syllabus statement about the Core area and associated career competencies. This resource developed by the Center for Excellence in Teaching and Learning and Online Education at Georgia State University includes template syllabus statements for each of the Core IMPACTS areas that you may adapt for your course.

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.

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 your courses. 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 us online at success.gatech.edu/tutoring, email us at tutoring@gatech.edu, or come see us at 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)