CEE 4120 Syllabus

Construction Operations | CEE 4120-A | 3 Credits

Spring 2027

Instructor Information

Instructor: Dr. Yong K. Cho

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General Course Information

Description

This heavy/highway construction course introduces the fundamentals of major construction equipment and earthwork operations. It is designed for all CEE students and is particularly recommended for those interested in heavy/civil construction projects from either a design or construction perspective. Topics include construction site development, earthmoving materials, equipment economics, excavation and excavation stability, loading and hauling operations, equipment fleet productivity estimation, cranes and lifting operations, equipment safety, construction automation, robotics, and field demonstrations.

Course Learning Outcomes

Upon completion of this course, the student is expected to be able to:

- Understand the types and functions of the most commonly used equipment in heavy construction.
- Plan and sequence safe site development, earthwork, and lifting operations.
- Optimize a spread of multiple types of equipment to perform specific earthmoving operations under schedule and cost constraints.
- Experience state-of-the-art construction technologies, including 3D reconstruction, construction automation, and robotics.

Course Materials

The following course materials are optional:

- Construction Methods and Management, 8th edition, S. W. Nunnally, Pearson Prentice Hall, ISBN 0-13-500079-3.
- Construction Equipment Management, 2nd edition, John E. Schaufelberger and Giovanni C. Migliaccio, Routledge, 2019.
- Caterpillar Performance Handbook, Edition 48 or later: https://wheelercat.com/cat-performance-handbook/

Grading Policy

A: 90.00–100%; B: 80.00–89.99%; C: 70.00–79.99%; D: 60.00–69.99%; F: 59.99% or lower.

Assignments

- Participation, 10%
- Quizzes, 5%
- Homework, 20%
- Exam 1, 20%
- Exam 2, 20%
- Final Exam, 25%

Description of Graded Components

Homework will be assigned frequently throughout the semester and is essential to understanding lecture materials. Homework should be submitted digitally on Canvas by the due date before the beginning of class. Students must submit their own homework, except for assigned group homework, for which one group submission is permitted.

Exams and quizzes cover material from lecture slides, notes, handouts, homework, movies, guest lectures, and/or projects. Unless stated otherwise, quizzes, tests, and examinations are closed book and notes. The final exam will be held on the date assigned by the university.

Course Policies

Attendance and/or Participation

Class attendance is mandatory. Students are expected to attend class regularly, arrive on time, and actively participate in classroom activities. Two unexcused absence is allowed without penalty during the semester. Each additional unexcused absence will result in a two-percentage-point deduction from the final course grade, up to a maximum deduction of 10 percentage points. Attendance deductions are separate from the 10% participation grade, which reflects students' active engagement in class. Students remain responsible for missed assignments, quizzes, and exams. Institute-approved excused absences will be accommodated. Using cell phones, tablets, or computers for personal web searches, email, texting, or other coursework during class is inappropriate and may negatively affect the participation grade.

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

Georgia Tech emphasizes the importance of maintaining an atmosphere of mutual respect, acknowledgment, and responsibility between faculty members and students. The Student-Faculty Expectations Agreement outlines the shared expectations and responsibilities of both faculty and students. Mutual respect, commitment to learning, academic integrity, and professional interactions are essential to creating a positive and productive learning environment. All members of the Georgia Tech community are expected to uphold these principles..

Collaboration, Group Work, and Use of Generative AI

Homework assignments are intended for individual effort. Students may work with classmates, but must list the names of all collaborators on the cover sheet and submit their own work. For assigned group homework, only one submission per group is permitted. Quizzes, tests, and exams are to be completed individually.

Generative AI tools may be used to study course concepts, brainstorm approaches, and check understanding. However, students must independently complete and verify all submitted answers, calculations, and explanations; submitting AI-generated work as one's own is not permitted. Students must disclose any AI tool used for an assignment and how it was used. Generative AI is not permitted on quizzes or exams unless explicitly authorized by the instructor.

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

Late homework will be graded for the benefit of the student, but no credit will be given. Missed exams receive a grade of zero except for university-excused circumstances. Exams will not be rescheduled to accommodate personal travel or conflicts with other exams, except where required by Georgia Tech policies. Students needing to miss class due to documented personal emergencies may contact the Office of the Dean of Students for assistance.