[CEE 4510-ZNCM*] Spring 2025

Structural Steel Design, 3 Credits

***** ZNCM: No-cost: $0 required costs,

The No-cost designator is for use with courses that exclusively use course materials that are free of charge to students. These materials may include open educational resources (OER), institutionally licensed campus library materials that all students enrolled in the course have access to use, and other materials that require no additional cost to students.

Open educational resources (OER) are high-quality teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license, such as a Creative Commons license, that permits their free use and repurposing by others, and may include other resources that are legally available and free of cost to students.

OER include, but are not limited to: full courses, course materials, modules, textbooks, faculty-created content, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge.

Instructor Information

Instructor	Email	Office Hours
Professor Abdul-Hamid Zureick	azureick@ce.gatech.edu	Office hours will be announced and shared with students.

General Information

Description

An introductory course that addresses principles of behavior and design of structural steel members subjected to tension, compression, flexural, and shear. Specific topics discussed in this course include, but are not limited to,

1) **Introduction to Steel Structures:** Material Properties and Product Availability

2) Design Specifications, Standards, and Codes: Professional Responsibilities, Code of Ethics, and Design philosophies.

3) **Members subjected to Compression:** Brief historical account and theoretical background related to the buckling of axially loaded members, behavior and design criteria for doubly, singly, and non-symmetric sections; built-up members.

4) **Doubly Symmetric Members Subjected to Flexure and Shear:** Theoretical background; the concept of a plastic hinge, flexural design provisions -- Lateral-Torsional Buckling; Flange Stability; Web Stability; Shear buckling and shear design Provisions; serviceability limit states.

5) **Bolted and Riveted Connections:** Introduction; Types of Bolted Connections; failure modes and limit states, design provisions for simple connections, gusset plates, and detailing.

6) **Tension Members:** Introduction; failure modes of bolted members subjected to tension, and design criteria.

Pre- &/or Co-Requisites

Undergraduate Semester level CEE 3055 Minimum Grade of D. Knowledge of steel material properties is necessary.

Course Goals and Learning Outcomes

Upon successful completion of this course, students should develop a clear understanding of the:

1) current state-of-the-art knowledge involving those fundamental principles, theory, assumptions, limitations, and investigative procedures that are essential for the understanding of the behavior and design of elementary steel structural members and systems.

2) underlying basis for, and the details of, relevant provisions of the AISC ***Specification for Structural Steel Buildings.***

Course Requirements & Grading Distribution

Homework Assignments..... 20%
Test 1- Date: TBD..... 15%
Test 2- Date: TBD..... 15%
Project..... 30%
Final Exam (Check OSCAR-GT Web Access System) 20%

Grading Scale

Your final grade will be assigned as a letter grade according to the following scale:
A (90-100%), B (80-89%), C (70-79%), D (60-69%), F (0-59%)

Course Materials

1) Code of Ethics for Engineers, Free download from the National Society of Professional Engineers or the American Society of Civil Engineers (ASCE)
2) https://www.asce.org/career-growth/ethics/code-of-ethics
3) https://www.nspe.org/sites/default/files/resources/pdfs/Ethics/CodeofEthics/NSPECodeofEthicsforEngineers.pdf
4) ANSI/AISC 360-22
5) SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, American Institute of Steel Construction. A pdf version is available from AISC.org. or you may check the availability of the document at the Georgia Tech Library (http://library.gatech.edu/)
6) COMPANION TO THE AISC STEEL CONSTRUCTION MANUAL, AISC.org
7) AISC Shapes Database v16.0.xlsx. You can also have v15.0.xlsx for this class. See AISC.org.
8) Zureick, A. CEE 4510 Class Notes-will be posted on Canvas
9) Additional Resources (Available from the Georgia Tech Library):

    - ASCE/SEI 7-22 Minimum Design Loads for Buildings and Other Structures
    - The International Building Code (IBC)
    - Aghayere, Abi, Vigil, Jason (2020). Structural Steel Design, A Practice-Oriented Approach, Third Edition, Pearson, ISBN: 978-1-68392-367-1
    - Segui, William T. (2012). "Steel Design: ASD/LRFD," ISBN-10: 1111576009 | ISBN-13: 978-1111576004
    - Williams, Alan (2011) "Steel Structures Design: ASD/LRFD, ISBN-10: 0071638377 | ISBN-13: 978-0071638371 | Edition: 1
    - Geschwinder, Louis F. (). "Unified Design of Steel Structures" ISBN-10: 0470444037 | ISBN-13: 978-0470444030 | Edition: 2
    - Salmon, Charles G., Johnson, John E., and Malhas, Faris A. (2008). "Steel Structures, Design and Behavior" Fifth Edition, Prentice-Hall, ISBN-10: 0131885561 | ISBN-13: 978-0131885561

Course announcements and additional handouts can be accessed via: https://canvas.gatech.edu/

Course Expectations & Guidelines

Course Type Expectations Tool

Students will attend classes in person and will work remotely, in groups on a semester-long design project. Homework assignments will be submitted on Canvas.

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. For information on Georgia Tech's

Academic Honor Code, please visit http://www.catalog.gatech.edu/policies/honor-code/ or http://www.catalog.gatech.edu/rules/18/.

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.

Accommodations for Students with Disabilities

Any student with learning needs that require special accommodation shall 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 the special needs and to obtain an accommodations letter.

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

1) Homework and project assignments must be turned in on the due date. Late homework assignments will be corrected but will receive zero grade credit.
2) Students are expected to take tests and the final examination at the assigned time. Make –up tests and final examination(s) can only be arranged when accompanied by persuasive and valid reasons or when are in accordance with the "approved Institute activities" (http://www.catalog.gatech.edu/rules/4/

Student Use of Mobile Devices in the Classroom

No cell phone use for making/receiving calls, text messaging, or checking emails is allowed.

Notebook, laptop, or tablet computer usage is permitted only if these devices are used to take notes or to perform specific tasks during the lecture.

Recordings of Class Sessions and Required Permissions:

Classes may not be recorded by students without the express consent of the instructor unless it is pursuant to an accommodation granted by the Office of Disability services. Class recordings, lectures, presentations, and other materials posted on Canvas are for the sole purpose of educating the students currently enrolled in the course.

Students may not record or share the materials or recordings, including screen capturing or automated bots, unless the instructor gives permission. Digitally proctored exams may require students to engage the video camera, but those recordings will not be shared with or disclosed to others without consent unless legally permitted.

Campus Resources for Students

There is a wide range of campus resources available to Georgia Tech students. This includes:

The Center for Academic Success: (http://www.success.gatech.edu/) offers a variety of academic support services to help students succeed academically at Georgia Tech (e.g. tutoring, peer-led study groups, study skills, etc.).

The Communication Center: (http://www.communicationcenter.gatech.edu/) provides support for students with respect to developing competency and excellence in written, oral, visual, electronic, and nonverbal communication.

The Library: (http://www.library.gatech.edu/) provides students with many services besides borrowing privileges including access to technology and technical assistance, online access to many journals and databases, and subject and personalized research assistance. You can place course materials on reserve behind the reference desk or request a librarian teach an instructional session for your class.

The Office of Disability Services: (disabilityservices.gatech.edu/) ensures that students with disabilities have equal access to all programs and activities offered at Georgia Tech. They provide documentation and officially sanctioned requests for accommodation for students and serve as a resource for instructors as they build learning environments to meet the needs of all students.

OMED: Educational Services: (omed.gatech.edu/) is the unit charged by Georgia Tech with the retention, development, and performance of the complete student learner who is traditionally underrepresented: African American, Hispanic, and Native American. OMED's programming and academic support services are aimed at equipping all students with strategies to navigate the Georgia Tech environment.

The Division of Student Life: (studentlife.gatech.edu/) – often referred to as the Office of the Dean of Students – offers resources and support for all students in our community. You can refer students to Student Life, or contact them for help identifying appropriate campus resources and resolving problems with students.

Support for Students in Distress Counseling Center: (http://www.counseling.gatech.edu/) 404-894-2575

Dean of Students (Student Life): (http://www.studentlife.gatech.edu/) 404-385-8772

GT Police: (http://www.police.gatech.edu/) 404-894-2500

Stamps Health Services: (http://www.health.gatech.edu/) 404-894-1420