Summer, 2026

Structural Engineering
Saturdays, starting May 30th
5:30-6:30 PM ET

An Online Group Class
Offered by Eric Anthony Comstock, M.S. Aerospace Engineering '24
Georgia Tech PhD candidate,
and Davidson Young Scholar alumnus
and Milena Bringman, B.S. Mechanical Engineering '27

Supervising Instructor: Eric A. Comstock

I have a BS in aerospace engineering (*magna cum laude*) with engineering honors and minors in math and chemistry from Texas A&M University in College Station. I recently graduated with an M.S. in Aerospace Engineering in December of 2024 from Georgia Tech. I am currently a PhD candidate at Georgia Tech in aerospace engineering. I created this class for Davidson Young Scholars, and have been teaching classes for the past three years. I can be reached at: **eric.comstock@gatech.edu**

Instructor: Milena Bringman

I am a mechanical engineering student at the Georgia Institute of Technology with a 4.0 GPA and a strong commitment to academic excellence and student support. As a member of Tau Beta Pi (Engineering Honor Society) and initiate of Pi Tau Sigma (Mechanical Engineering Honor Society) and Pi Delta Phi (French Honor Society), I have a commitment not only to scholarship and achievement, but also a dedication to strong character, integrity, and service. I have experience working with K–12 students through hands-on project-based STEM programs. There, I help create engaging and structured learning environments that build curiosity and confidence. Through my work as a Program Assistant with Georgia Tech CEISMC, I have experience in creating and delivering STEM-focused lessons and have developed the ability to explain complex concepts clearly and to adapt my approach to different learning styles. I also bring a global perspective to my work. I have studied abroad in Metz, France where I participated in a French immersion program centered on sustainable energy and urban infrastructure.

I am passionate about helping students build strong study habits, improve problem-solving skills, and gain confidence in challenging subjects. I strive to create a supportive, professional, and personalized learning environment that meets each student's individual needs and goals.

Course Overview

Structural engineering is the foundation of modern engineering and building design. It focuses on systems in equilibrium, and how they react to internal and external forces. It is important for truss design, bridges, civil infrastructure in general, and design of structural elements in all manner of systems to ensure that material failure does not happen. It is a very common subject for interviews, skills demonstration, and is widely treated as a fundamental of the engineering business environment. If you are interested in structural design, machinery, civil or mechanical engineering, or simply in how to design structures that are stable and safe, then this class is for you!

There is no age requirement for this class. Having grown up as an academically accelerated Davidson student, I realize that age has no bearing on intellectual merit.

I. Topics covered

1. **Introduction**
    a. Units and Dimensions
    b. Linear algebra
        i. Vectors and vector components
        ii. Dot and cross product
        iii. Norm
2. **Forces**
    a. Moments and Forces
        i. Moments and Couples
        ii. Moments about a line
        iii. Equivalent systems
    b. Connections
        i. Pin connections
        ii. Joint connections
        iii. Fixed connections
        iv. Bearings
        v. Ball and socket
    c. Equilibrium of Rigid Bodies
        i. Free-body Diagrams
        ii. Equilibrium in 2D and 3D
        iii. Moments and 2D Equilirbium of Rigid Bodies
3. **Complex structures**
    a. 2D Structural Applications
        i. Plane trusses
    b. Frames
        i. Method of sections

    ii. Method of pins
  c. Centroids and Distributed Forces
    i. Centroids
    ii. Method of Composite Parts
    iii. Distributed Loads
  d. 3D Trusses and Centroids
4. **Beams**
  a. Inertial Forces on Beams
    i. Shear force
    ii. Bending moment
  b. PMV Diagrams
    i. Method of area
    ii. Method of sections
5. **Friction**
  a. Sliding
  b. Tipping

II. Homework and Grading

Homework will be on all three weeks, and will be assigned one class and generally due at 11:59 PM ET on Mondays, nine days after assignment on Saturday. Homeworks will typically consist of 3-4 questions per homework. Every week that the homework is late will deduct from the student's grade, as follows:

0 to 1 days late	-3% reduction
1 day to 1 week late	-15% reduction
1 week to 2 weeks late	-30% reduction
2 weeks to 3 weeks late	-45% reduction
Greater than 3 weeks late	-60% reduction

Homeworks that are incomplete may be submitted, and questions that are answered later will have their grades deducted individually based on the above rubric. My fundamental goal is helping these students learn and not punishing them for turning in homework late. While some standards are necessary for any learning environment, I want my learning environment to be sensitive to the needs of young learners in order to encourage and foster a love of math and science.

I generally expect to give short but thought-provoking homeworks, designed to test understanding of as much of the material as possible as quickly as possible. Students are thus highly encouraged to come to office hours or reach out to me via email to ask questions about the homework – I will be happy to help them through the solution to a similar problem. Extra credit will be available on some homeworks, but its inclusion is up to my discretion. If included, it will usually involve some kind of proof or generalization.

The student's total grade will be determined as follows:

Homework weighted average	90%
Attendance	10%

III. Prerequisites

Students are recommended to enter the course with knowledge of Calculus BC or equivalent (such as my Calculus primer from May 9th to May 23rd), and the Pythagorean theorem. Enthusiasm for learning, as well as the ability to pick up concepts quickly, will also enhance the experience significantly, since much of the course is designed to be driven by individual curiosity.

IV. Schedule

Classes will be held on Saturday 5:30 PM ET, beginning Saturday, May 30th according to the schedule below. My office hours will be on [TBD] for questions related to the homework, a resource which students are strongly encouraged to use.

Preliminary Schedule (First three blocks)	
Date	***Class number***
First Block: $80	
May 30	1
Jun 6	2
Second Block: $200	
Jun 13	3
Jun 20	4
Jun 27	5
Jul 4	6
Jul 11	7
Third Block: $200	
Jul 18	8
Jul 25	9
Aug 1	10
Aug 8	11
Aug 15	12

Blocks are how tuition is billed. Please see the tuition section below for more information.

V. Tuition

Tuition will be $40 per hour-long class, once per week. Upon payment receipt, a link will be sent to join the online class.

Since the class is being produced in collaboration between myself (Eric Comstock) and Milena Bringman, the first block of tuition ($80 for two classes) should be split between the two of us to secure your spot in the class.

That is:

Tuition ($40) to Eric Comstock may be paid via Zelle to
Eric Comstock, eric.comstock@gatech.edu.
Or via check to
2170 Summit Mist Dr., Conroe, Texas, 77304

Tuition ($40) to Milena Bringman may be paid via Zelle to
Milena Bringman, mbringman1@gmail.com.
Or via check to
2129 Grove Point Rd, Savannah, Georgia, 31419

After the first block, tuition should be split between the supervising instructor, Eric Comstock, and the instructor, Milena Bringman, in a similar way, for each block.

VI. Textbook

There will be no textbook. Lectures will be based on lecture notes which will be provided.

VII. Online meeting platform

We will be using an application that I have access to that does not require any software for the student. It is very easy to use. All the student needs is an internet connection, a browser, microphone and camera. The student will merely click on a link sent via email and allow access to their microphone and camera, then they will join the meeting. Most browsers work with this platform.

Milena will be providing most of the course material, but I will be there to provide additional rigor and information where needed, to supervise, and to awnser any additional questions the students have.

VIII. General Expectations

Given that this class is open to all ages, I must emphasize that students must behave in a manner that is appropriate to all ages during the class. That is, older students must refrain from speaking about any topics that are inappropriate for younger students. This rule will be strictly enforced.

I will not wait for tardy students, and will always start exactly on time. Please try to come to class on time.

I do take attendance, and while it is not a large component of your grade, it can make the difference between an A and a B. I will deduct points if you are not in class and do not have an excuse. Please let me know beforehand if you cannot make class.