

Assistant Professor John Evans
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Mary Bastawrous
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Time: Tuesday/Thursday, 1:15 pm – 2:30 pm
Location: AERO 111 (Tu: Last Names A-K, Th: Last Names L-Z)

Zoom Link: <https://cuboulder.zoom.us/j/92493180405>
Zoom Meeting ID: 924 9318 0405

John Evans: Tuesday/Thursday, 4:00 pm – 5:00 pm
Mary Bastawrous: Monday/Wednesday, 4:30 pm – 5:30 pm

Zoom Link: <https://cuboulder.zoom.us/j/97725619027>
Zoom Meeting ID: 977 2561 9027

Canvas ([_____](#))

Introduces finite element methods used for solving linear problems in structural and continuum mechanics. Covers modeling, mathematical formulation, and computer implementation.

This class requires an undergraduate course in matrix algebra. Students should also have experience with vector calculus and differential equations, and it is highly recommended that

1. History of Finite Element Analysis
2. Finite Element Analysis of a One-Dimensional Model Problem
3. Finite Element Analysis of Two-Dimensional Steady Heat Conduction
4. Primal Finite Element Analysis of Plane Strain Linear Elastostatics
5. Mixed Finite Element Analysis of Plane Strain Linear Elastostatics
6. Finite Element Analysis of Plane Strain Linear Elastodynamics

The class meets twice a week for an hour and fifteen minutes of formal lecture and discussion.

10% Homework Assignments (4 x 2.5%)
15% Mini-Project Assignment
25% Midterm Quizzes (5 x 5%)
20% Midterm Exam
30% Final Exam

Grades will be posted to the class website on Canvas.

There will be four homework assignments covering both theory and implementation:

Assignment 1: One-Dimensional Finite Element Analysis
Assigned: 09-03, Due: 09-24 (Start of Class)
Assignment 2: Finite Element Analysis of Steady Heat Conduction
Assigned: 10-15, Due: 11-05 (Start of Class)
Assignment 3: Primal Finite Element Analysis of Plane Strain Linear Elastostatics
Assigned: 11-05, Due: 11-19 (Start of Class)
Assignment 4: Mixed Finite Element Analysis of Plane Strain Linear Elastostatics
Assigned: 11-19, Due: 12-03

Students will use MATLAB to implement a finite element method for a one-dimensional model problem in the first half of the semester:

There will be a midterm exam on November 10, 2020. This midterm exam will test material associated with “History of Finite Element Analysis”, “Finite Element Analysis of a One-Dimensional Model Problem”, and “Finite Element Analysis of Two-Dimensional Steady Heat Conduction”. It will also test material associated with Homework Assignments 1 and 2, the Mini-Project Assignment, and Midterm Quizzes 1-4.

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A Slack channel has been created to foster communication. Students will receive an e-mail invitation to join this channel. Students can use Slack to ask questions regarding lecture material, homework and mini-project assignments, midterm quizzes, and the midterm and final exams.

Generally speaking, late assignment submissions will not be accepted, and there will be no make-up quizzes or exams. That being said, we are living in unusual times, so please contact the instructor if you are unable to submit an assignment or take a quiz or exam due to illness, technical issues, or other challenging extenuating circumstances. Reasonable accommodations will be made where appropriate provided you contact the instructor before the assignment due date or quiz or exam date.

As a matter of public health and safety due to the pandemic, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements, and public health orders in place to reduce the risk of spreading infectious disease.

Required safety measures at CU Boulder relevant to the classroom setting include:

- maintain 6-foot distancing when possible,
- wear a face covering in public indoor spaces and outdoors while on campus consistent with state and county health orders,
- clean local work area,
- practice hand hygiene,
- follow public health orders, and
- if sick and you live off campus, do not come onto campus (unless instructed by a CU

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition, see [Temporary Medical Conditions](#) on the Disability Services website.

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code (honor@colorado.edu); 303-492-5550). Students found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the [Honor Code Office website](#).

The University of Colorado Boulder (CU Boulder) is committed to fostering an inclusive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, or protected-class discrimination or harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127

or cureport@colorado.edu. Information about the OIEC, university policies, [anonymous reporting](#), and the campus resources can be found on the [OIEC website](#).