Welcome to Math 345, Fall 2023

Instructor: Evan Camrud (Pronouns: He/Him/His. You can call me "Evan" or "Dr. Camrud".)

Email: evan.camrud@colostate.edu

Office: Weber 129

Meeting Dates/Places: MWF: 12-12:50pm Engineering E 203 (lecture)

T: 12-12:50pm Weber 205 ("lab")

Office hours: MTWF: 12:55-1:25pm Weber 129 (my office)

- Office hours time window is strict. I have another obligation at 1:30pm.
- If my door is closed during office hours time, and I have not made an announcement cancelling office hours for the day, it means I had to go somewhere *quick* and will be back very soon.

Textbook: *Ordinary Differential Equations Done Right*, by Evan Camrud (yes me)

- Supplementary texts:
    - *Elementary Differential Equations*, by William F. Trench
        - Some exercises may come from this text, and there is an associated Student Solutions Manual
    - *Ordinary Differential Equations and Dynamical Systems*, by Gerald Teschl
        - Some exercises may come from this text.

Required supplies:

- Wolfram cloud account (free)
    - If you have Wolfram Mathematica access, this works too
- A way to *access* Wolfram cloud during class
    - This can either be via a laptop computer, tablet, or phone
- If you are unable to have access during class, please talk to me

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Course Description: (from catalog) First and second order equations, Laplace transforms, first order systems of equations, numerical methods, applied linear algebra, linearization.

- In particular, my version of the course stresses *applied linear algebra* more than any of the others.
    - This is primarily what sets this course apart from Math 340.
    - If you are uncomfortable with linear algebra, I strongly recommend changing enrollment to Math 340.
- We approach the topics of *first and second order equations* directly by way of the topic *first order systems of equations*.
- The *numerical methods* introduced include Galerkin methods (and other truncation methods), and Euler's method.
- *Laplace* (and Fourier) *transforms* are motivated and constructed to satisfy the pitfalls of Galerkin methods.
- Finally, *linearization* is introduced to understand the local stability of nonlinear systems, since the rest of the methods encountered apply more directly to linear ODEs.

Grading scale: (there may be a curve at the end of the semester)

A	≥93
A-	≥90
B+	≥87
B	≥83
B-	≥80
C+	≥77
C	≥70
C-	N/A
D+	≥67
D	≥60

D-	N/A
F	<60

Assignments and Grade weights: LATE ASSIGNEMTS WILL **NOT** BE ACCEPTED EXCEPT FOR VERY RARE CIRCUMSTANCES (*e.g.*, extended illness, or other extended excused absences).

- Assignments (30%): Due at the end of day ***each Tuesday*** (except the first).
    - This is a "flipped classroom", and you will be completing (hopefully *most* of) your assignments during class MWF.
    - You will be placed in random groups of 3 (or 4) students for each week's HW.
    - Each student in a group is required to create their own HW solution sheet, but the "solving process" may be the same for each member of a group.
    - During each Tuesday, we will hold a recitation, followed by a quiz.
    - The "non-proof" problems are ***graded on accuracy*** (out of 10pts). These will be denoted by an *asterisk* * on the assignment.
    - The "proof" problems are graded on completion alone (out of 1pt). Full credit for a "complete" statement of proof, even if incorrect. (That is, don't give up and you get full credit.)
    - Assignments should be uploaded to Canvas.
- Video Responses (5%):
    - To hold you accountable for watching the flipped classroom videos, there will be a video response assignment (on Canvas) for each video.
    - These should take no more than 5 minutes to finish.
    - Video responses are due before each MWF meeting time (due at noon).
- Peer Participation Score (10%):
    - Since you are completing your assignments in groups of 3 or 4, you are expected to attend class and assist your peers.
    - Along with turning in your assignments at the end of class Tuesday, you are required to fill out a *peer participation score* form, grading your peers' participation (in your group).
    - These scores will be updated on Canvas every 4 weeks, to ensure that no students know who specifically has given them good/bad participation scores. (That is, this will keep scoring slightly more anonymous.)
    - This score will include daily attendance (unless excused). Therefore, ***daily attendance is required***.
- Quizzes (45%):
    - Each Tuesday, during the final 10 minutes of class, we will have a quiz.
    - All quizzes will be "marked" by me, for accuracy, but...
    - ***Only quizzes of EVERY OTHER week (beginning week 2) will have accuracy entered into the gradebook.*** (Each is entered out of 10pts.)

    - That is, during the weeks which aren't entered, the quizzes are meant as PRACTICE quizzes. (Each is entered out of 1pt for completion, but "graded" out of 10pts for feedback.)
    - All quizzes are ***open PAPER notes*** (including printed book).
    - ***No technology*** is allowed.
    - Quizzes will start as soon as all technology is put away, and students have separated from each other as much as possible. (If you don't do this yourselves, I will tell you where to move.)
    - ***These replace all traditional exams*** in this class, and will be ***graded in a manner consistent with traditional exam grading***. (It will not be uncommon to receive 0 points on some of these.)
- Final Exam presentation (10%):
    - Instead of a final exam, we will be holding poster presentations.
    - You must choose a differential equations topic/chapter from the list I provide (*no later than 1 month before the Final Exam period)*, and create a poster. That is, include
        - Motivation
        - Definition(s)
        - Theorem(s) and perhaps their proof(s)
        - Exercise(s) and solution(s)
    - These will be graded according to a rubric which I will share (*no later than 1 month before the Final Exam period*).
- Extra credit? (<1%):
    - Extremely good participation (asking a lot of questions, answering posed questions, helping others outside of class, being courteous to others, etc.) has a chance of earning ***extra credit*** (<1% of final grade) in this category. This is *only* applied in cases when a <1% difference in the final grade will change the letter grade outcome. *This is the ONLY way to earn extra credit in the course and/or bump up a letter grade at the end of the semester.*

Path for success: To succeed (earn a C) in this course, you should

1. Attend class,
2. Complete all assignments,
3. Write down all definitions and theorems in an easily-accessible place,
4. Attempt each exercise alone, and consult others only when you are at your wits end,
5. Use your groups for assistance outside of class,
6. Be able to complete problems (on quizzes/exams) *similar* to those in the assignments without help.

To earn a B, you should also

- Be able to complete problems (on quizzes/exams) *dissimilar* to those in the assignments without help.

To earn an A, you should also

- Be able to easily *teach others* how to complete problems *dissimilar* to those in the assignments without help.

Academic misconduct: this course adheres to the "Academic Integrity Policy of the Colorado State University General Catalog and the Student Conduct Code".

I list the following forms (although this list is not exhaustive) of academic misconduct:

- Cheating; includes using unauthorized sources of information and providing or receiving unauthorized assistance on any form of academic work or engaging in any behavior specifically prohibited by the faculty member.
- Plagiarism; includes the copying of language, structure, ideas, or thoughts of another, and representing them as one's own without proper acknowledgment.
- Unauthorized Possession or Disposition of Academic Materials; includes the unauthorized selling or purchasing of examinations or other academic work; stealing another student's work; unauthorized entry to or use of material in a computer file; and using information from or possessing exams that an instructor did not authorize for release to students.
- Falsification; any untruth, either verbal or written, in one's academic work.
- Facilitation; knowingly assisting another to commit an act of academic misconduct.

The use of online "homework helper" sites including, but not limited to, Chegg, NoteHall, Quizlet, and Koofers is not permitted in this course. Please reach out to me to discuss if a specific service you are thinking about using for this course is acceptable.

Use of these types of resources will be considered receiving unauthorized assistance and, therefore, is academic misconduct.

In particular, participation in academic misconduct dilutes the quality of the education one receives, as well as undermines the honest work of their peers, which has a right to be recognized as a valued achievement.

The punishment for academic misconduct is immediate failure of the course.

Student accommodations: For accommodation requests, please complete the relevant forms on the Student Disability Center website.

Tentative semester schedule:

Week Days/Dates	M 12:00-12:50 Eng. E 203	T 12:00-12:50 Weber 205	W 12:00-12:50 Eng. E 203	R No Class	F 12:00-12:50 Eng. E 203
August 21 - 25	Welcome to class	Introduction to the Wolfram Language	1.1/2/3		2.1/2
August 28 - September 1	2.3/4	Recitation/ Graded Quiz	2.5		2.6
September 4 - 8	Labor Day (no class)	Recitation/ Practice Quiz	3.1/2		3.3
September 11 - 15	3.4/5	Recitation/ Graded Quiz	4.1/2/3		4.4/5/6
September 18 - 22	5.1/2	Recitation/ Practice Quiz	6.1		6.2/3/4/5/6
September 25 - 29	6.7	Recitation/ Graded Quiz	7.1		7.2

October 2 - 6	7.3/4	Recitation/ Practice Quiz	7.5		7.6
October 9 - 13	8.1	Recitation/ Graded Quiz	8.2		8.3/4/5
October 16 - 20	9.1	Recitation/ Practice Quiz	9.2/3		9.4/5/6
October 23 - 27	10.1/2	Recitation/ Graded Quiz	10.3		10.4
October 30 - November 3	10.5	Recitation/ Practice Quiz	11.1/2		11.3
November 6 - 10	11.4	Recitation/ Graded Quiz	12.1		12.2
November 13 - 17	12.3	Recitation/ Practice Quiz	12.4		13.1
November 20 - 24	***FALL***	***BREAK***	***NO***		***CLASS***

November 27 - December 1	13.2	Recitation/ Graded Quiz	13.3		14.1/2
December 4 - 8	14.3	Recitation/ Practice Quiz	***No class***	Final Poster Presentations 8-11AM	***No class***
December 11 - 15			Final Poster Presentations 4:10-5:10PM		