MATH 253X – Calculus III

(F253X F01 CRN 33470)

MTWF 8:00 – 9:00
4 hours via Zoom
`https://eallman.github.io/classes/253/253_2021.html`

Instructor: Elizabeth S. Allman, Chapman 308B, e.allman@alaska.edu and 474-2479.

Office Hours: Monday 9:00, Wednesday 9:00 am, and by appointment. Please contact me via e-mail to set up a Zoom appointment.

Teaching Assistant: Isela Amezquita `ieamezquita@alaska.edu`

Textbook: Calculus (standard or 'early transcendentals') *or* Multivariable Calculus, 8th ed., by J. Stewart, Brooks/Cole, Chapters 12-16 only

Required Online Access: WebAssign **Class Key:** uaf 4175 1226

Grading: There will be two midterms, numerous quizzes administered through Gradescope, and a cumulative final exam in Calclulus. There will also be written homework assignments each week submitted through Gradescope. Grades will be assigned using the following weights:

WebAssign Homework	10 %
Written Homework	10 %
Quizzes	10 %
Midterm (20% each $\times 2$)	40 %
Final Exam	30 %

The midterms are scheduled for Tuesday, February 9 and Tuesday, March 23 from 8:00 - 9:30. These are *IN PERSON* at a safe social distance, so please plan accordingly. The cumulative final exam will take place as published in the schedule of courses, on (tentative) Tuesday, April 27 from time TBA. Makeup exams will not be given.

Course Overview and Goals:

Multivariable calculus is concerned with functions of many variables. Whereas in MATH 251 and MATH 252 you study functions of a single variable (height as a function of age $h(a)$, $f(x)$), in multivariable calculus functions will have more input variables (temperature of a particle in 3-space) or be vector-valued functions (position in 3-space $(x(t), y(t), z(t))$.

Our goal this semester is to extend your knowledge of calculus into the 2-, 3-, and $n-$dimensional realms. All of the techniques you learned from single variable calculus come into play here. Indeed, taking derivatives and computing integrals in the multivariate setting depends intimately on the ability to apply skills from univariate calculus.

Other interesting topics like vector fields and alternative coordinate systems appear. Multivariate calculus is essential for further study in physics, chemistry, engineering, economics, statistics and many other fields, as well as in mathematics. Though visualization in three dimensions can be hard at first, the benefit is well worth the effort.

Student Learning Outcomes: Students will become competent in multivariable calculus, and gain some experience of its applications to other fields. Students will be able to visualize surfaces in three dimensions, and compute double and triple integrals, and multivariate derivatives.

Course Mechanics:

Class meetings will be run as interactive lectures, to the extent possible given the enrollment and the Zoom interface. That means that you will have your cameras on, and I will be asking for suggestions, ideas, and questions about the material as we go along. I don't expect 'correct' answers, but I do expect you to be actively following and participating (and taking notes).

CLASS ATTENDANCE is expected, although I will not formally take roll. If you miss a class, you should watch the video promptly. Homework assignments will be posted on the course web page either right before class or soon after class is over. You should bookmark the homework web page, as this is where you will find assignments, due dates, and updates.

HOMEWORK: As a reminder, the class key for WebAssign homework is uaf 4175 1226
Online homework in WebAssign will be assigned daily and is due two school days later. Ideally you will do it before the next class, so that I can answer questions in a timely manner. Written homework will also be assigned on most days, but will submitted to Gradescope on Tuesday.

Short quizzes will be given most Fridays, roughly about one per week. These will typically take 10-15 minutes and be similar to recent homework. You will download them and upload them to Gradescope independently at any time you like, though they are time-stamped. You must submit your quiz by 11:59 pm on the day it becomes available. The primary goals of these are 1) a check that you have understood recent concepts, and 2) some direct feedback on your written solution skill.

MISSED EXAMINATIONS that are not approved in advance will result in an 'F' on that exam. No make-up exams will be given except in extreme circumstances. Notifying me by email or a note that you will miss an exam is not sufficient for advance approval; you must speak with me to be excused.

TUTORING is available at no cost, on an appointment-basis, via Zoom with tutors from the Math Lab. You can make 1-on-1 appointments for tutoring, and this is a great way to make up for a weak background or just to check that you are understanding recent material.

CALCULATORS will not be allowed on any examinations or quizzes. It is thus probably best to do homework without them.

AUDITING of this course will only be allowed for those who agree to attend regularly, as evidenced by completion of midterm exams and most quizzes.

Course Outline:

For a tentative schedule of topics and midterm dates, check the last page of this syllabus. Mark your datebooks now with the time for our final exam: (tentative) Tuesday, April 27, time TBA. Students must take the final exam at the scheduled time.

Covid-19 adaptations: Most importantly, please do your best to stay healthy AND as a subsidiary goal to learn Calculus III. These are extraordinary times, but the mental discipline of llformal earning under these circumstances can be both rewarding and helpful. To the extent possible in a 'hybrid' format, I will offer MATH 253 as usual. Of course, sickness or increased illness in the community may change our plan, so I ask your forbearance while we try to muddle through with remote learning. As a courtesy and to achieve our goal of making this course as 'normal' as possible, please turn your videos on during lecture.

Please **do** keep up with current UAF policies on the pandemic:
"Students should keep up-to-date on the university's policies, practices, and mandates related to COVID-19 by regularly checking this website:

`https://sites.google.com/alaska.edu/coronavirus/uaf/uaf-students?authuser=0`

Further, students are expected to adhere to the university's policies, practices, and mandates and are subject to disciplinary actions if they do not comply."

Things you should do ASAP:

1. Sign into Blackboard so you can see that our class is accessible to you.
2. Click on the Gradescope and Zoom links in Blackboard to make sure they load.
3. Enroll in WebAssign for this course using the class key.

Other Policies:

Course accommodations: If you need course adaptations or accommodations because of a disability, please inform your instructor during the first week of the semester, after consulting with the Office of Disability Services, 203 Whitaker (474-7403).

University and Department Policies: Your work in this course is governed by the UAF Honor Code. The Department of Mathematics and Statistics has specific policies on incompletes, late withdrawals, and early final exams, some of which are listed below. A complete listing can be found at

`http://www.dms.uaf.edu/dms/Policies.html`.

Student protections and services statement: Every qualified student is welcome in my classroom. As needed, I am happy to work with you, disability services, veterans' services, rural student services, etc to find reasonable accommodations. Students at this university are protected against sexual harassment and discrimination (Title IX), and minors have additional protections. As required, if I notice or am informed of certain types of misconduct, then I am required to report it to the appropriate authorities. For more information on your rights as a student and the resources available to you to resolve problems, please go the following site: `www.uaf.edu/handbook/`

Prerequisites: The prerequisite for MATH 253X is MATH 252X with a grade of C- or better. Students not meeting this prerequisite are not eligible to take this course and will be dropped.

Late Withdrawal: This semester the last day for withdrawing with a 'W' appearing on your transcript is April 26. If, in my opinion, a student is not participating adequately in the class, I may elect to drop this student.

Graded Coursework: Please keep all graded work for MATH 253X until final grades have been assigned.

Academic Honesty: Academic dishonesty, including cheating and plagiarism, will not be tolerated. It is a violation of the Student Code of Conduct and will be punished according to UAF procedures.

Grade Bands: A, A- (90 - 100%), B+,B, B- (80 - 89%), C+, C, C- (70 - 79%), D+, D, D- (60 - 69%), F (0 - 59%). On rare occasion, I may lower the thresholds. Also, in an effort to reward the student who makes significant improvement over the course of the term, a stellar grade on the final may overcome a deficiency on a midterm and improve a student's final grade.

Courtesies: As a courtesy to your instructor and fellow students, please arrive to class on time, turn your cell phones and iPods off during class, and pay attention in class. Put your VIDEO on.

Tentative Schedule

	Dates	Content	Comments
Week 1	Jan 11, 12, 13, 15	12.1, 12.2, 12.3, 12.4	
Week 2	Jan 19, 20, 21	12.5, 12.5, 12.6	M holiday
Week 3	Jan 25, 26, 27, 29	13.1, 13.2, 13.3	
Week 4	Feb 1, 2, 3, 5	13.3, 13.4	
Week 5	Feb 8, 9, 10, 12	14.1, 14.2, 14.3	**Exam 1** Tuesday, Feb 9
Week 6	Feb 15, 16, 17, 19	14.4, 14.4, 14.5, 14.5	
Week 7	Feb 22, 23, 24, 26	14.6, 14.6, 14.7, 14.8	
Week 8	Mar 1, 2, 3, 5	15.1, 15.2, 15.2, 15.3	
	Mar 8 - 12		Spring break
Week 9	Mar 15, 16, 17, 19	15.4, 15.4, 15.5	
Week 10	Mar 22, 23, 24, 26	15.6, 15.7, 15.8	**Exam 2** Tuesday, Mar 23
Week 11	Mar 29, 30, 31, Apr 2	15.9, 16.1, 16.2, 16.2	
Week 12	Apr 5, 6, 7, 9	16.3, 16.3, 16.4, 16.5	
Week 13	Apr 12, 13, 14, 16	16.6, 16.6, 16.7, 16.7	
Week 14	Apr 19, 20, 21, 23	16.8, 16.9	
	Apr 26		April 26 last day for W
		Final exam time TBA	Happy Summer!