MATH 253X – Calculus III

(F253X F01)

MWRF 8:00 – 9:00
Gruening 409
`https://eallman.github.io/classes/253/253_2020.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. These office hours may change at a later date, depending on student demand and scheduling concerns. Please note that the best way to reach me is by e-mail.

Teaching Assistant: Samaneh Yourdkhani, `syourdkhani@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 5692 0311`

Grading: There will be two midterms, numerous unannounced quizzes, and a cumulative final exam in Calclulus. 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 Thursday, February 13 and Thursday, March 26 from 8:00 - 9:30. The cumulative final exam will take place as published in the schedule of courses, on Thursday, April 30 from 8:00 – 10:00. 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. That means that while I am presenting material at the board, and you are taking notes, 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 get notes from another student. 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 5692 0311`

Online homework in WebAssign will be assigned daily. Ideally you will do it before the next class, although you will have two days to do it before late penalties apply. Written homework will also be assigned on most days, but will only be collected each Wednesday. Selected problems will be graded by a teaching assistant, with the entire assignment checked for completeness.

Short surprise quizzes will be given randomly, about once per week. These will typically take 10-15 minutes and be similar to recent homework. These serve two primary purposes 1) to encourage you to be present in every class and 2) to ensure that you stay current with the homework. If you expect to miss a class, you should talk to me in advance about having any potential quiz waived — you must have a good reason and, except in emergencies, you cannot get retroactive approval.

I will typically begin each class by asking if there are questions about the last lecture and its homework assignment. That means you should review notes and make at least an initial attempt on homework problems before the next class meeting, even though problems may not be due until a day later. While it never hurts to ask, in general I will defer questions about any earlier assignment to my office hours, in order to keep the course moving along.

I encourage you to work with others on the homework, but you must *write up solutions independently.* You will learn nothing from simply copying someone's solution.

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 (e.g., family death, documented illness, etc.). 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 a walk-in basis, at the Math Lab in Chapman 305. Hours will be announced, and posted on the door. A good way to use the Math Lab is to simply go there to do your homework, so that if any questions come up you can get immediate help.

CALCULATORS will not be allowed on any examinations or quizzes. This will ensure that testing conditions are equal for everyone. 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: Thursday, April 30, 8:00 – 10:00. Students must take the final exam at the scheduled time.

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 March 27. 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.

Tentative Schedule

	Dates	Content	Comments
Week 1	Jan 13, 15, 16, 17	12.1, 12.2, 12.3, 12.4	
Week 2	Jan 22, 23, 24	12.5, 12.5, 12.6	M holiday
Week 3	Jan 27, 29, 30, 31	13.1, 13.2, 13.3	
Week 4	Feb 3, 5, 6, 7	13.3, 13.4 14.1	
Week 5	Feb 10, 12, 13, 14	14.2, 14.3	**Exam 1** Thursday, Feb 13
Week 6	Feb 17, 19, 20, 21	14.4, 14.4, 14.5, 14.5	
Week 7	Feb 24, 26, 27, 28	14.6, 14.6, 14.7, 14.8	
Week 8	Mar 2, 4, 5, 6	15.1, 15.2, 15.2, 15.3	
	Mar 9 - 13		Spring break
Week 9	Mar 16, 18, 19, 20	15.4, 15.4, 15.5	
Week 10	Mar 23, 25, 26, 27	15.6, 15.7, 15.8	**Exam 2** Thursday, Mar 26
			Mar 27 last day for W
Week 11	Mar 30, Apr 1, 2, 3	15.9, 16.1, 16.2, 16.2	
Week 12	Apr 6, 8, 9, 10	16.3, 16.3, 16.4, 16.5	
Week 13	Apr 13, 15, 16, 18	16.6, 16.6, 16.7, 16.7	
Week 14	Apr 20, 22, 23, 24	16.8, 16.9	
	Apr 27		
		Final exam	Happy Summer!
		Th Apr 30 8-10	