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CALCULUS III
MATH F253X-UX1, FALL 2020 - CRN: 75308, 4 CREDITS
DURATION: 8/24/2020-12/12/2020

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Instructor information

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Virtual office Hours:	MWF 5:00 pm - 6:00 pm		

Course materials

- *WebAssign* access code for the textbook below

- Textbook: *Calculus: Early Transcendentals*, by James Stewart, Eighth Edition from Cengage Learning

- a PDF file creator (like a scanner/PDF merger for paper submissions or the use of a tablet)

The textbook indicated above is available at the UAF bookstore in a loose leaf version bundled with the WebAssign access code (ISBN-13: 978-1-305-61669-1). If you wish to bypass the paper-based book, you can purchase the WebAssign access code by itself either at the UAF bookstore (ISBN-13: 978-1-285-85826-5) or from their Cengage website as it contains an electronic version of the textbook.

Course Description

Catalog description: "Multivariable calculus. Topics include vectors in 2- and 3-dimensions; differential calculus of functions of several variables; multiple integration; vector calculus, including Green's and Stokes' Theorem; and applications."

This is the third and final course in the basic calculus sequence. Whereas Calculus I and II dealt with univariate calculus, Calculus III applies several of the concepts learned previously but to functions of several variables. The course covers most of the contents of Chapters 12-16 of our textbook. Topics include but are not limited to: vectors, surfaces, parametric curves, motion in three dimensions, limits, continuity, partial derivatives, chain rule, tangent planes, directional derivatives, extrema, Lagrange multipliers, multiple integrals (double and triple, and in varied coordinate systems) and their applications, vector fields, line and surface integrals, and major vector calculus theorems like the Fundamental Theorem of Line Integrals, Green's Theorem, Stokes' Theorem and the Divergence Theorem.

The prerequisite for this course is MATH252X - Calculus II with a grade of C- or better or an AP score of 4 or 5 on the Calculus BC high school AP exam.

Instructional methods & Course goals

This course is designed for online instruction primarily through UAF Blackboard, but active participation from the students is expected. This is not an *independent study* course. Regularly scheduled assignments and assessments with firm due dates will pace the course. All exams (COVID-permitting) will be proctored, closed book, closed notes and no calculators.

The main purpose of this course is to present calculus concepts in the context of functions of several variables and their many applications in science and engineering fields as well as mathematics.

- Students will acquire a basic understanding of vectors and vector calculus.

- Students will enrich their prior calculus knowledge to learn to deal with multivariate situations.

- Students will use appropriate mathematical models to solve problems involving multivariable calculus.

- Students will learn to describe and perform calculus computations on surfaces in 3D.

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Evaluation

Grading: Students will be continuously evaluated throughout the semester according to

- Online homework (5%),
- Written homework (10%),
- Quizzes (10%),

- Midterm Exams 1-3 combined (45%),

- and the Final (30%).

The grading scale used will be the normal letter grades with plus/minus:

A+	97-100%	**B+**	87-89%	**C+**	77-79%	**D+**	67-69%	**F**	Below 60%
A	93-96%	**B**	83-86%	**C**	73-76%	**D**	63-66%		
A-	90-92%	**B-**	80-82%	**C-**	70-72%	**D-**	60-62%		

I reserve the right to lower the threshold in case of outstanding progress over the course of the semester.

Per DMS policy, Incomplete (**I**) will only be given in cases where the student has completed the majority (normally all but the last three weeks) of a course with a grade of **C** or better, but for personal reasons beyond his/her control has been unable to complete the course during the regular term. Negligence or indifference are not acceptable reasons for granting an incomplete grade.

Students that have not participated substantially in the course will be dropped or withdrawn (**W**) if prior to the withdrawal deadline. Per DMS policy still, a late withdrawal will normally be granted only in cases where the student is performing satisfactorily (i.e., **C** or better) in a course, but has exceptional reasons, beyond his/her control, for being unable to complete the course. These exceptional reasons should be detailed in writing to the instructor, department head and dean. Documentation, such as a letter from a physician, may be required. A late withdrawal is not to be given if the sole justification is the prevention of a failing grade.

A grade of **D+**, **D**, or **D-** in a Core (X) class – such as the present class – will automatically require the student to re-take the class to receive core credit. In other words, you need a minimum grade of **C-** to count this class towards your core requirements.

Course policies

Active participation: You are expected to complete a majority of all assigned work. Failure to attempt *five* assessments/assignments in a row (online/written homework and/or quiz) may result in the immediate withdrawal from the course if prior to the withdrawal deadline.

Course materials: You are expected to study all required materials according to the timeline given on Blackboard. This will play a big role in your success in the class. Expect a time commitment of roughly 16-20 hours a week to be spread among learning and assignments/assessments. All materials are accessible through Blackboard.

Homework: Homework is associated to each lesson (in addition to the First Contact Assignment). There are two parts to each lesson homework. The online part will be posted and completed on the *WebAssign* website. Online homework is due before 8 pm. You will be allowed five attempts on each question. You may request an extension (through email or directly from the site) for 48 additional hours at a penalty of 25% on the part of the assignment not submitted on time.

In addition, I will assign a set of problems to be done by hand. You need to show all work leading to the solution. Written homework is due on the same day as the online one before midnight. You will submit the written homework as a single PDF file on Blackboard.

You may not collaborate or use any form of online help (solution manuals, question/answer boards, etc.). But you are encouraged to ask me questions about assignments (during office hours, or by email) or use the services of the UAF MathLab (online tutors are available).

Late written homework is accepted but at a potential penalty. The grade for a late written homework will be the minimum between the grade your work would have earned if turned in on time and the total possible number of points minus two points per day late (including weekends).

Extra credit for homework: Lessons which do not feature an associated video lecture will include concept check questions which can be submitted for extra credit towards the associated homework (if turned in on time).

Quizzes: Quizzes will be given regularly on **Thursdays** (see schedule). No form of collaboration or help is allowed on quizzes. In particular, quizzes are closed book, closed notes, and calculator-free. Material from quizzes will be similar to those in lecture notes and homework assignments. On the designated day of the quiz, you will log in to Blackboard past 8 pm to take the quiz, and you will have 40 minutes total to work out the problems and enter your PDF file with the solutions. The deadline to complete the quiz (not start it) is midnight. No make-up for quizzes is allowed.

Extra credit for quizzes: There are four miniquizzes corresponding to lessons not covered in the regular quizzes (see schedule). Same procedure as the regular quizzes, but these are not compulsory and count only as extra credit.

Exams: There will be three two-hour midterm exams (exact dates (COVID-permitting) are **September 23rd**, **October 28th** and **November 18th**) and a cumulative two-hour final exam (**December 9th**). No form of collaboration or help is allowed on the exams. The exams should be proctored on the indicated days either at the eCampus center (COVID-permitting) or via video conferencing. Expect further communications as the dates near because of the need for flexibility related to the evolving guidelines.

Student responsibilities and services

COVID-19: 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.

Internet access: Students are expected to maintain a working backup plan to be implemented in the event of a computer malfunction or an interruption of their normal Internet service during the course. But there are built-in extra credit opportunities that can help cover occasional technology issues (see homework and quiz sections).

Academic integrity and plagiarism: Academic dishonesty or misconduct constitutes a violation of UAF Student's Code of Conduct and is punishable according to the procedures outlined by UAF's rules and regulations. Scholastic dishonesty includes, but is not limited to, cheating, plagiarism, and collusion. Cheating includes providing answers to or taking answers from another student. Plagiarism includes the use of another author's words or arguments without attribution. Collusion includes unauthorized collaboration with another person in preparing work that is part of the course requirement.

Student protection and services: 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/

UAF Math Services: <u>Free</u> help for your math classes is available remotely with online tutoring. Info about the services and how to make appointments is on the DMS website and the direct link is the following: `http://www.uaf.edu/dms/mathlab`

Course calendar

The course covers most of the contents of Chapters 12-16 of our textbook. The following is a (summarized) *schedule* of the reading/viewing assignments, homework, quizzes, and exams:

	Monday	Tuesday	Wednesday	Thursday	Friday
			Date:		
			Reading/viewing assignment:		
			Homework		
			Quizzes / Exams		
August	24 12.1	25 12.1 *First contact assignment*	26 12.2 HW 1	27 12.2	28 12.3 HW 2
September	31 12.3 HW 3	1 12.4	2 12.4 HW 4	3 12.5 Quiz 1	4 12.5 HW 5
	7 Labor Day *no classes*	8 12.6	9 12.6/13.1 HW 6	10 13.1 Quiz 2	11 13.2 HW 7
	14 13.2/13.3 HW 8	15 13.3	16 13.4 HW 9	17 13.4 Quiz 3	18 14.1 HW 10
	21 Review miniQuiz 1	22 Review	23 Midterm #1	24 14.1	25 14.2 HW 11
October	28 14.2 HW 12	29 14.3	30 14.3/14.4 HW 13	1 14.4 Quiz 4	2 14.4/14.5 HW 14
	5 14.5 HW 15	6 14.6	7 14.6/14.7 HW 16	8 14.7 Quiz 5	9 14.7/14.8 HW 17
	12 14.8 HW 18	13 15.1	14 15.1/15.2 HW 19	15 15.2 Quiz 6	16 15.3 HW 20
	19 15.3/15.4 HW 21	20 15.4	21 15.4/15.5 HW 22	22 15.5 Quiz 7	23 15.6 HW 23
	26 Review miniQuiz 2	27 Review	28 Midterm #2	29 15.6	30 15.7 HW24

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	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
November	2 15.7/15.8 HW 25	3 15.8	4 15.9 HW 26	5 15.9 Quiz 8	6 16.1 HW 27
	9 16.1/16.2 HW 28	10 16.2	11 16.3 HW 29	12 16.3 Quiz 9	13 16.4 HW 30
	16 16.4 HW 31	17 Review miniQuiz 3	18 Midterm #3	19 16.5	20 16.5/16.6 HW 32
	23 16.6 HW 33	24 16.7	25 Thanksgiving Break *no classes*	26	27
December	30 16.7 HW 34	1 16.8	2 16.8/16.9 HW 35	3 16.9 Quiz 10	4 Review HW 36
	7 miniQuiz 4	8	9 **Final exam**	10	11

Table 1: See Blackboard for expanded printable version

Important dates to remember

(See also `https://catalog.uaf.edu/calendar/`.)

Last day to register/add/drop classes	Friday, September 4
Labor Day - No classes	Monday, September 7
Last day for student- and faculty-initiated withdrawals	Friday, October 30
Thanksgiving Break - No classes	Wednesday-Friday, November 25-27
Final Exam	Wednesday, December 9