Instructor: Jennifer Thorenson

Textbook: James Stewart, Multivariable Calculus, 8th Ed., Cengage Learning, 2015

Prerequisite: Math 253

Email: jthoren2@uoregon.edu

Office: 3 Deady Hall

Office Phone: 541-346-4711

Office Hours: Monday and Wednesday at 10-11am, Friday at 11-11:50am or by appointment.

Course Description: Math 281 is the first of two quarters on Multivariable Calculus. It is the study of differential calculus of vector-valued functions and multivariable functions. The course begins with vectors, vector operations and the geometry of space. It then transitions to the geometry of multivariable functions as surfaces in space, the definition of partial derivatives, and the gradient vector and its use in optimization of multivariable functions.

Workload: There will be homework due every week, as well as reading and class attendance. An average well-prepared student should expect to spend about 12 hours per week on this class.

Homework: A combination of WeBWorK and written homework will be used for assigned homework. These two components of the weekly homework will be due on Tuesday where the written assignment must be submitted by the beginning of class. Late assignments will not be accepted. However, special circumstances may be considered if notified in person prior to the due date. These assignments will be in addition to homework from the text (listed on the following page) which will not be collected, but is mandatory. The graded homework will not provide sufficient practice to learn the material or even cover all of the material so you must keep up with the text problems as well.

Note: WeBWorK homework can be found at

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webwork.uoregon.edu/webwork2/Math281-13776

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Your username is your duckid and your password is the same as your UO email password. If you have any difficulty logging in, please let me know as soon as possible.

While completing the WeBWorK assignments, it is important to write out all steps on a piece of paper. Even though the WeBWorK assignments are submitted online and all it grades is your final answer, it is crucial that you complete the assignment as if it is read and graded by me for your own understanding and as a means to practice writing solutions for exams. These assignments should be used as a study aid, but can only be useful if you have a complete solution.

When help is needed, WeBWorK has an Email Instructor button on the bottom of the screen. Please include as much detail as possible about what you have tried to solve the problem and the work you have done towards a solution. In WeBWorK, all I can view is your submitted answer so simply stating that the answer is incorrect and that you need help will not provide me with enough information to assist you.

Exams: There will be two in-class exams during the term; the first exam is on October 19 and the second exam is on November 16. The final exam is cumulative and scheduled for December 7 at 10:15am. Exams can only be taken other than the scheduled time if arrangements are made in **advance** and a valid and admissible reason for not attending the scheduled time is provided. However, the final exam will not be administered early.

Bring your UO student ID to all exams.

Grade: The final grade will be based on homework (25%), midterm exams (20% each) and the final exam (35%). The following grade distribution will be used for this course.

Percentage	Grade
90-100%	A-, A, A+
80-89%	B-, B, B+
70-79%	C-, C, C+
60-69%	D-, D, D+
0-59%	F

Learning Environment: The University of Oregon strives for inclusive learning environments. Please notify me if the instruction or design of this course results in disability-related barriers to your participation. You are also encouraged to contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or uoaec@uoregon.edu.

Classroom Environment: Disruptive behavior in the classroom will not be tolerated. Leaving class early or arriving late, unless by prior agreement with the instructor, is considered disruptive behavior. All cell phones and music players must be turned off during the class period.

Academic Misconduct: The code of student conduct and community standards is at http://conduct.uoregon.edu. While I encourage students to study together, any submitted homework must be your own and reflect your own understanding. It is not appropriate to help each other on exams, to look at other students' exams, or to bring unauthorized material to exams. In the event of academic dishonesty, the offense will be reported to the Office of Student Conduct and Community Standards and the student will be sanctioned up to receiving a failing grade in the course.

Course Goals: Students should be able to understand the geometry of space, vectors and the differential calculus of vector functions and multivariable functions. This overall goal includes:

1. The computation and understanding of the vector operations dot product and cross product and their applications to determine equations of lines and planes in space, the projection of a one vector onto another vector, and volume.

2. Recognize the basic quadric surfaces; cylinders, paraboloids, hyperboloids of one sheet, hyperboloids of two sheets, cone and ellipsoids.

3. The definition of a vector-valued functions and the computation of derivatives and integrals of these functions.

4. The computation and understanding of partial derivatives of multivariable functions. The use of partial derivatives to find the tangent plane to a surface and find the best linear approximation of a function.

5. The definition of the gradient vector and understanding of its geometry and use in optimization of multivariable functions.

6. Use the second derivative test to classify critical points as local minima, local maxima or saddle points. Use the method of Lagrange multipliers to find local minima and local maxima of functions subject to constraints.

Tentative Schedule

MONDAY	TUESDAY	WEDNESDAY	FRIDAY
September 26 12.1	27 12.1-12.2	28 12.2-12.3	30 12.3
October 3 12.4	4 12.5	5 12.5	7 12.6
10 12.6	11 13.1	12 13.1	14 13.2
17 13.2	18 **Review**	19 **Exam I**	21 13.3
24 13.3	25 13.4	26 13.4	28 14.1
31 14.1	**November** 1 14.2	2 14.2	4 14.3
7 14.4	8 14.5	9 14.5	11 14.6
14 14.6	15 **Review**	16 **Exam II**	18 14.7
21 14.7	22 14.8	23 14.8	25 No Class
28 14.8	29 **Review**	30 **Review**	**December** 2 **Review**
Final Exam: Wednesday, December 7th, 10:15am			

Homework from the Text

Sec.	Problem	Sec.	Problem
12.1	5, 6, 7, 12, 13, 16, 24, 29, 30, 34, 36, 41	13.4	3, 5, 11, 12, 16, 19, 20, 23, 25, 31, 44
12.2	3, 5, 10, 14, 21, 26, 34, 36, 40, 41	14.1	5, 8, 13, 15, 19, 20, 25, 27, 31, 32, 59-64
12.3	1-13 odd, 17, 19, 23, 31, 41, 43, 50, 51, 53	14.2	5, 9, 10, 11, 15, 17, 18, 31, 33, 35, 39-41
12.4	2, 3, 9, 12, 13, 19, 28, 29-37 odd, 41, 53	14.3	16, 22, 25, 31, 33, 50, 53, 56, 65, 81, 95, 96
12.5	5, 9, 12, 19, 21, 27, 30, 33, 37, 40, 48, 51, 53, 57, 71, 73	14.4	2, 5, 11, 13, 14, 17, 35, 36, 37
12.6	1, 4, 5, 6, 11, 14, 16, 19, 21-28, 41, 42, 45	14.5	3, 5, 7, 11, 12, 22, 23, 24, 35, 39, 40, 45
13.1	1, 3, 7, 11, 13, 21-27, 40, 41, 43	14.6	4, 8, 9, 12, 16, 21, 23, 24, 31, 33, 43, 51, 63
13.2	3, 5, 7, 10, 13, 18, 23, 27, 35, 36, 54	14.7	5-17 odd, 29-35 odd, 39, 41, 45, 46, 47, 50
13.3	1, 3, 4, 11, 13, 17, 21, 23, 24, 47, 49, 55	14.8	3-11 odd, 19, 21, 29, 31, 35, 36, 37, 40