

**Instructor:** Jennifer Thorenson

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**Office:** 333C Tykeson Hall

**Office Phone:** 541-346-4711

**Office Hours:** Monday and Tuesday at 1-2pm, Friday at 10-11am or by appointment.

**Textbook:** James Stewart, Multivariable Calculus, 9th Ed., Cengage Learning, 2020

**Prerequisite:** C- or better in Math 253

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**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. Unless otherwise announced, the WeBWorK assignments will be due on Tuesday and Friday at 11:59pm. Each WeBWorK assignment will have a “reduced scoring period” where the assignment can be completed for 80% credit for up to three days beyond the listed due date. The written homework will be due weekly on Tuesday and submitted in class. There will be a one day grace period for submitting the written homework assignment.

**Expectations for Homework:** Solutions must be carefully written in a legible manner presenting your work in a clear, logical, and orderly way. Having the correct final answer is not sufficient. I am more interested in assessing your ability to write complete explanations of the solutions demonstrating your understanding of the material than if you find the correct final answer to the question. If you submit homework that is written hastily and lacking detail, you should expect to receive very little credit.

**WeBWorK:** WeBWorK homework can be found at

<https://uowebwork.uoregon.edu/webwork2/Math281-13321>

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 of the material 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 25 and the second exam is on November 22. The final exam is cumulative. It is scheduled for 10:15-12:15pm on Friday, December 13 in a classroom to be announced later in the term. By University policy, final exams must be given during the scheduled time and therefore requests to take the final exam at a time different from the scheduled time will not be granted.

At the end of the term, the lower of the two midterm exam grades will be replaced by the final exam grade, if it improves your final course grade.

**Attendance:** Attendance is not required, except during exams. Since the course material is difficult and covered quickly, it is strongly encouraged that you attend each lecture and ask questions either during class or office hours when help is needed.

If you are unable to attend class on the scheduled dates of the two midterm exams, then you must notify the instructor prior to the exam to schedule a makeup exam. You will have until the Tuesday following the scheduled Friday exam to complete the exam, preferably during office hours. If you cannot complete the exam on either Monday or Tuesday, then the missing exam grade will be replaced by the final exam grade when computing final course grades. If both midterm exam grades are missing, then only one of the grades will be replaced by the final exam grade and the other grade will be recorded as a zero.

There will be no makeup for missing the final exam. If you meet the criteria for an incomplete, as outlined at

<https://registrar.uoregon.edu/current-students/incomplete-policy>

then in the event of missing the final exam, you can request an incomplete.

**Grade:** The final grade will be based on homework (25%), midterm exams (20% each) and the final exam (35%). Based on the following table, you are guaranteed to earn at least that grade, but grades may be adjusted at the end of the term depending on the outcomes of the course.

A+	98–100%	B+	87–89%	C+	77–79%	D+	67–69%	F	0–59%
A	93–97%	B	83–86%	C	73–76%	D	63–66%		
A–	90–92%	B–	80–82%	C–	70–72%	D–	60–62%		

**Classroom Environment:** Students are expected to behave respectfully toward each other and toward the instructor during class time. This includes refraining from using cell phones and other disruptive electronic devices during lectures.

**Academic Misconduct:** The code of student conduct and community standards is at <https://conduct.uoregon.edu/conduct>. While I encourage students to study together, any submitted homework must be your own and reflect your own understanding. It is not appropriate to copy homework solutions from another student, to copy solutions from the internet or the text book's solutions manual. 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.

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**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, vector projections, and volume.
2. Recognize the basic quadric surfaces; cylinders, paraboloids, hyperboloids of one or 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.
7. Use the method of Lagrange multipliers to find local extrema of functions subject to constraints.

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**Tentative Schedule:**

Week 1	12.1-12.3	Week 6	14.1-14.3
Week 2	12.4-12.6	Week 7	14.4-14.6
Week 3	12.6-13.2	Week 8	14.6-14.7 (exam 2)
Week 4	13.2-13.3 (exam 1)	Week 9	14.7-14.8
Week 5	13.3-14.1	Week 10	14.8, review

## Additional Information About Campus Policies

**Accessible Education Center:** The University of Oregon and I are dedicated to fostering inclusive learning environments for all students and welcomes students with disabilities into all of the University's educational programs. The Accessible Education Center (AEC) assists students with disabilities in reducing campus-wide and classroom-related barriers. If you have or think you have a disability and experience academic barriers, please contact the AEC to discuss appropriate accommodations or support. Visit 360 Oregon Hall or [aec.uoregon.edu](mailto:aec.uoregon.edu) for more information. You can contact AEC at 541-346-1155 or via email at [uoaec@uoregon.edu](mailto:uoaec@uoregon.edu)

**Reporting Obligations:** I am a Designated Reporter under the University's Prohibited Discrimination and Retaliation Policy. As a Designated Reporter, I will direct students who disclose prohibited discrimination and harassment, including sexual harassment or violence, to resources that can help. I am also obligated to report the information shared with me to the University's Title IX Coordinator/Office of Investigations and Civil Rights Compliance. Recognizing that students may be fearful about what will happen when a report is submitted to the University, an OICRC team member will reach out to you to share information, options, and support resources. You may request supportive measures from OICRC without sharing additional information about your experience, including a No Contact Directive and academic supportive measures.

Students who have experienced sexual assault, relationship violence, sex or gender-based bullying, stalking, and/or sexual harassment may seek confidential resources and help at [safe.uoregon.edu](https://safe.uoregon.edu). Students may call the SAFE 24-hour hotline at 541-346-SAFE [7244].

In addition, students experiencing any form of prohibited discrimination or harassment may find information and resources at [investigations.uoregon.edu](https://investigations.uoregon.edu) or contact the non-confidential Title IX Coordinator/OICRC at 541-346-3123 or the Dean of Students Office at 541-346-3216 for help. Specific details about confidentiality of information and reporting obligations of employees can be found at [investigations.uoregon.edu/employee-responsibilities](https://investigations.uoregon.edu/employee-responsibilities).

**Clery Crimes:** On an annual basis, the university is required to compile and publish campus crime statistics. If you disclose a crime that occurred on university owned or controlled property, information about that crime will be shared with the Clery Coordinator in a de-identified manner, meaning that your name and contact information will not be shared with the Clery Coordinator.

**Mandatory Reporting of Child Abuse:** Under Oregon law, UO employees, including faculty, staff, and graduate employees, are mandatory reporters of child abuse. If you disclose information about child abuse to a UO employee, whether you are reporting your own experience or child abuse or neglect that someone else experienced, I am required to report that information to law enforcement or the Department of Human Services. Please refer to the following link for detailed information about mandatory reporting: [Mandatory Reporting of Child Abuse and Neglect](#).

**Pregnancy Modifications:** Pregnant and parenting students are eligible for academic and work modifications related to pregnancy, childbirth, loss of pregnancy, termination of pregnancy, lactation, and related medical conditions. To request pregnancy-related modifications, students should complete the Request for Pregnancy Modifications form on the OICRC website. OICRC coordinates academic and other modifications for pregnant and parenting students to ensure students can continue to access their education and university programs and activities.

**Accommodations for Religious Observances:** The university makes reasonable accommodations, upon request, for students who are unable to attend a class for religious obligations or observance reasons, in accordance with the university discrimination policy which says "Any student who, because of religious beliefs, is unable to attend classes on a particular day shall be excused from attendance requirements and from any examination or other assignment on that day. The student shall make up the examination or other assignment missed because of the absence. To request accommodations for this course for religious observance, visit the Office of the Registrar's website (<https://registrar.uoregon.edu/calendars/religious-observances>) and complete and submit to the instructor the Student Religious Accommodation Request form prior to the end of the second week of the term."

**Accommodations for Military and Federal Agency Deployment:** A student that is a member of the military, a member of the commissioned corps of the National Oceanic and Atmospheric Administration or a member of the Public Health Service of the United States Department of Health and Human Services detailed by proper authority for duty with the Army or Navy and who is ordered to federal or state active duty, or called to unit training, assembly or annual training, regardless of the length of duty or training, and who presents verification of active duty/reserve component training, has the following rights:

- The student may drop or withdraw from courses, with refund, even after published deadlines; or
- Receive a grade of incomplete and, upon release from active duty/reservist training, complete the course in accordance with the University of Oregon's practice for completion of incomplete courses; or
- Continue and complete the course for credit subject to the conditions in section 4 of this policy (see link below).

If this applies to you, please let me know as early in the term as possible so that we can explore appropriate accommodations. The complete policy can be found here: [Military and Federal Agency Deployment Accommodation Rights](#)

**Academic Disruption due to Campus Event or Emergency:** In the event of a campus event or emergency that disrupts academic activities, course requirements, deadlines, and grading percentages are subject to change. Information about changes in this course will be communicated as soon as possible by email, and on Canvas. If we are not able to meet face-to-face, students should immediately log onto Canvas and read any announcements and/or access alternative assignments. Students are also expected to continue coursework as outlined in this syllabus or other instructions on Canvas.

**Inclement Weather:** It is generally expected that class will meet unless the University is officially closed for inclement weather. If it becomes necessary to cancel class while the University remains open, this will be announced on Canvas and by email. Updates on inclement weather and closure are also communicated in other ways described here: <https://hr.uoregon.edu/content/inclement-weather-immediate-updates>.

**Mental Health and Wellness:** Life at college can be very complicated. Students often feel overwhelmed or stressed, experience anxiety or depression, struggle with relationships, or just need help navigating challenges in their life. If you're facing such challenges, you don't need to handle them on your own—there's help and support on campus.

As your instructor if I believe you may need additional support, I will express my concerns, the reasons for them, and refer you to resources that might be helpful. It is not my intention to know the details of what might be bothering you, but simply to let you know I care and that help is available. Getting help is a courageous thing to do for yourself and those you care about.

University Health Services help students cope with difficult emotions and life stressors. If you need general resources on coping with stress or want to talk with another student who has been in the same place as you, visit the Duck Nest (located in the EMU on the ground floor) and get help from one of the specially trained Peer Wellness Advocates. Find out more at [health.uoregon.edu/ducknest](http://health.uoregon.edu/ducknest).

University Counseling Services (UCS) has a team of dedicated staff members to support you with your concerns, many of whom can provide identity-based support. All clinical services are free and confidential. Find out more at [counseling.uoregon.edu](http://counseling.uoregon.edu) or by calling 541-346-3227 (anytime UCS is closed, the After-Hours Support and Crisis Line is available by calling this same number).

**Basic Needs:** Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live and believes this may affect their performance in the course is urged to contact the Dean of Students Office (346-3216, 164 Oregon Hall) for support.

This UO webpage includes resources for food, housing, healthcare, childcare, transportation, technology, finances, and legal support: <https://blogs.uoregon.edu/basicneeds/food/>