MTH 254 (040): VECTOR CALCULUS I (4 credits – CRN 13374)

Fall 2019

Instructor: Dr. Filix Maisch, maischf@math.oregonstate.edu

Instructor Office Hours: Kidder 368C, MWF 10-10:50am (WF hrs in MSLC – KIDD 108H)

Class Meetings: MWF 1-1:50 PM in Johnson Hall 102 (with a Thursday recitation – times vary)

TA: David Guillory, guillord@oregonstate.edu

TA office hours: Kidder 360, MWF 9:00-9:50

*** Please take advantage of these office hours to get help!! We are here for you. ***

Prerequisites: Math 252 (or Math 252H) with a C- or better.

Textbook: Calculus, Early Transcendentals, Briggs, Cochran, et al. (3rd edition)

Course Description: A survey of vectors, vector functions, and curves in two and three dimensions. Functions of many variables, with a focus on surfaces in three dimensions, partial derivatives, gradients, and directional derivatives. Multiple integrals in rectangular, polar, cylindrical, and spherical coordinates. Along the way, physical and geometric applications are included.

Course Content: Vectors, dot products, cross products, vector-valued functions and curves, the calculus of curves including motion, arc length, functions of many variables and their limits, partial derivatives, the Chain Rule, directional derivatives and the gradient, tangent planes, optimization of functions of two variables, double integrals, polar coordinates and double integrals in polar coordinates, triple integrals, spherical coordinates and cylindrical coordinates including triple integrals in these coordinate systems, change of variables.
Course Specific Learning Outcomes: A successful student in Math 254 will be able to:

1. Represent vectors both algebraically and geometrically and be able to use vector methods effectively in problem solving.
2. Use the dot and cross product to solve problems in a geometrical or physical setting.
3. Differentiate and integrate vector-valued functions.
4. Apply partial derivatives, directional derivatives, and gradients to solve problems of multivariable differential calculus such as max-min problems and rates of change of physical processes in space.
5. Evaluate multiple integrals in rectangular, polar, spherical, and cylindrical coordinates with applications such as volumes and mass.

Grading: Your grade is determined by a syllabus quiz, online homework AND written homework, participation in recitation group work activities, unannounced lecture discussion quizzes, two evening midterms, and a final. NO EXTRA CREDIT is available in this course.

The course will be graded as follows:

- Syllabus quiz 2%
- Online homework 8%
- Written homework 8%
- Participation in recitation activities: 8%
- Unannounced lecture discussion quizzes 9%
- Midterm 1 20%
- Midterm 2 20%
- Final 25%

Your grade in the course will not be harder than:
A-/A 90% - 100%, B-/B/B+ 80% - 89.99%, C/C+ 70% - 79.99%, D 60%-69.99%, F 0%-59.99%.

Syllabus Quiz: A short (canvas) quiz testing your knowledge of this syllabus will be available during weeks 0, 1 and 2. It’s due on Sunday, Oct. 13th. You ONLY get one attempt on each question.

Exams: There will be two midterms, and a cumulative final exam. Calculators nor notes are NOT allowed on exams. The final does NOT replace a midterm. Tests are not allowed to be made-up unless the circumstances are truly exceptional and contact requesting the accommodation is made PRIOR to the test. We will use Gradescope to grade exams. There will be an access link through Canvas (and an email sent out to encourage you to sign up). Through this online platform you will be able to see your graded exam and be able to request a regrade on any of the problems.

- First Midterm: Tuesday evening, Oct. 22nd at 7:00-8:20 PM, location TBAD
- Second Midterm: Tuesday evening, Nov. 19th at 7:00-8:20 PM, location TBAD
- Final Exam: Thursday MORNING, Dec. 12th at 7:30-9:20 AM, location TBAD
Recitation Group Activities: Recitation activities allow you to experiment with integral calculus concepts within a group of peers. You are expected to bring a printed copy of the activity or to be prepared to access it digitally during recitation. Your teaching assistant (TA) will be present to help facilitate conversation and provide guidance. Arriving to recitation on time, staying for the entire activity-time, and participating in the activity is required for your participation grade. These activities will not be turned in, but you are expected to complete the entire lab activity even if there was not enough time to complete it during recitation. There is no way to make up a missed recitation, unless you can prove you missed it due to an OSU-based obligation.

Written Homework: Most weeks (except week 0 and week 9) there will be a paper-and-pencil written homework assignment, which you are to turn-in at the START of recitation. This is intended for you to gain a deeper understanding of the material, and to give you good examples of what open-ended test problems might look like. These assignments will be posted sometime the week before. You will be graded on completeness, as long as what you turn-in looks relevant to the question.

Online Homework: Online homework can be accessed through Canvas. E-mail me ASAP if it doesn’t work. Due dates are set, but you are allowed to work on the homework late for a 10% penalty on problems attempted after the due date.

Lecture Discussion Quizzes: Given (unannounced) during many of the lectures are questions to be answered through a Canvas quiz, which will open and close during lecture. During the window of time the quiz is open you are given unlimited chances to answer. You are encouraged to work with your fellow classmates and to share your work/answers. No make-ups are allowed unless you can prove you missed class due to an OSU-based obligation. The lowest 5 of these will be dropped.

Student Conduct Code: Students are expected to be familiar with Oregon State University’s Expectations for Student Conduct. Please review these at the following web link:

http://studentlife.oregonstate.edu/code

Students With Disabilities: Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at http://ds.oregonstate.edu. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

MSLC: The Math and Statistics Learning Center (MSLC) is in Kidder 108H. You can go there for free drop-in tutoring. The hours are MTWTh 9-5, Fri 9-4, and Sunday through Thursday evenings 7-10.
Reach Out for Success: University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it’s important to reach out. Consider discussing the situation with an instructor or academic advisor. Learn about resources that assist with wellness and academic success at oregonstate.edu/ReachOut. If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255).

Inclusion Statement: It is my intent that students from all diverse backgrounds and perspectives be well-served by this course, that students’ learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender identity, sexual orientation, disability, age, socioeconomic status, ethnicity, race, religion, culture, perspective, and other background characteristics. Your suggestions about how to improve the value of diversity in this course are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.

Student Evaluation of Courses: The online Student Evaluation of Teaching system opens to students the Monday of dead week and closes the following Sunday. Students will receive notification, instructions and the link through their ONID. They may also log into the system via Online Services. Course evaluation results are extremely important and used to help improve courses and the learning experience of future students. Responses are anonymous (unless a student chooses to “sign” their comments agreeing to relinquish anonymity) and unavailable to instructors until after grades have been posted. The results of scaled questions and signed comments go to both the instructor and their unit head/supervisor. Anonymous (unsigned) comments go to the instructor only.

Course (Tentative) Calendar:

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<th>Week</th>
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Notes: Syllabus Quiz due Sun. 10/13/2019. For each Tuesday evening group midterm, there is a canceled class (GRP MID). The final is Thursday, Dec. 12th, at 7:30 AM (Location TBAD).

A note on course credits: This course expects approximately 120 hours of your effort for 4 credits.