MTH 254H: VECTOR CALCULUS I (4 credits – CRN 52051)

Spring 2019

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

Instructor Office Hours: Kidder 368C, MW 2-3:15pm (starting week 2, Wed. in MSLC – Kidder 108H)

Class Meetings: MW 10-10:50 AM and F 10-11:50 AM in LINC 343

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

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

Textbook: Calculus, Early Transcendentals, Briggs, Cochran, et al. (2nd edition)

Catalog 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, 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.
**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

**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, group work activities, unannounced lecture discussion quizzes, a midterm, and a final. NO EXTRA CREDIT is available in this course.

The course will be graded as follows:

- Syllabus quiz 2%
- Online homework 12%
- Group activities 16%
- Unannounced lecture discussion quizzes 10%
- Midterm 25%
- Final 35%

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 1 and 2. It’s due on Sunday, April 14th. You ONLY get one attempt on each question.

**Exams:** There will be one midterm and a cumulative final exam. Calculators are NOT allowed on exams. On the midterm you may have both sides of one 3 inch by 5 inch handwritten note card. On the final you may have both sides of one 4 inch by 6 inch note card. The final does NOT replace (nor partially replace) the 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 midterm and be able to request a regrade on any of the midterm problems. Since I want the option to re-use final exam problems in the future, the graded final exam will not be released. You may make an appointment with me after the final to review it.

- Midterm: Friday, May 3rd, 10:30-11:50 (in LINC 343)
- Final Exam: Monday afternoon, June 10th at 2:00-3:50 PM (in LINC 343 unless otherwise announced)
**Group Activities:** Group activities allow you to experiment with important course material within a group of peers. Most weeks, on Fridays, you will be asked to work on a group-work activity, due at the start of the following week’s Friday meeting. See the term calendar. It is your responsibility to print the activity from the course web page. Every group member individually is required to submit an activity. Each activity will be graded as follows: 50% for completion and 50% for correctness on a randomly chosen subset of the problems. Late activities will not be accepted unless there is an extraordinary circumstance.

**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 5% penalty only applied to the problems worked late. It is EXPECTED that you make every effort to complete the homework on time.

**Lecture Discussion Quizzes:** Given during some of the lectures (unannounced) are questions to be answered through a Canvas quiz, which will open during lecture and close 5 minutes after the 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 3 of these will be dropped.

**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. It is open STARTING week 2 going through Dead Week. The hours are MTWTh 9-5, Fri 9-4, and Sunday through Thursday evenings 7-10.

**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:

<table>
<thead>
<tr>
<th>Week</th>
<th>Monday</th>
<th>Wednesday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.1-11.2</td>
<td>11.3</td>
<td>11.4</td>
</tr>
<tr>
<td>2</td>
<td>11.5</td>
<td>11.6</td>
<td>11.7, Act. 1 due</td>
</tr>
<tr>
<td>3</td>
<td>11.8</td>
<td>11.9</td>
<td>12.1, Act. 2 due</td>
</tr>
<tr>
<td>4</td>
<td>12.2</td>
<td>12.3</td>
<td>12.4, Act. 3 due</td>
</tr>
<tr>
<td>5</td>
<td>12.5</td>
<td>Midterm Review</td>
<td>Midterm, Act. 4 due</td>
</tr>
<tr>
<td>6</td>
<td>12.6</td>
<td>12.7</td>
<td>12.8</td>
</tr>
<tr>
<td>7</td>
<td>12.9</td>
<td>13.1</td>
<td>13.2, Act. 5 due</td>
</tr>
<tr>
<td>8</td>
<td>13.3</td>
<td>13.4</td>
<td>13.5, Act. 6 due</td>
</tr>
<tr>
<td>9</td>
<td>MEMORIAL DAY (no class)</td>
<td>13.5</td>
<td>13.6, Act. 7 due</td>
</tr>
<tr>
<td>10</td>
<td>13.7</td>
<td>Catch-up/Review</td>
<td>Final Review, Act. 8 due</td>
</tr>
</tbody>
</table>

Notes: Syllabus Quiz due Sun. 4/14/2019. The final is Monday, June 10th, at 2 PM.