DIFFERENTIAL CALCULUS - MTH 251H (4 credits)

Fall 2018

CRN 12278

- Class meetings: MW 8-8:50am and Fri 8-9:50am in LINC 345
- Instructor: Dr. Filix Maisch
- E-mail: maischf@math.oregonstate.edu
- Office: Kidder 348
- Office hours: MWF 3:00-3:50pm (Fri. in MSLC)

Prerequisites: MTH 112, 150X, with a minimum grade of C- OR minimum score of 33 in 'Math Placement Test' OR minimum score of 075 in 'Math Placement - ALEKS'.

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

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

Catalog Course Description: Rates of change: the derivative, velocity, and acceleration. The algebraic rules of differential calculus and derivatives of polynomial, rational, and trigonometric functions. Maximum-minimum problems, curve sketching, and other applications. Antiderivatives and simple motion problems.

Course Content: Two-sided and one-sided limits; Infinite limits; Limits at infinity; Continuity; Intermediate Value Theorem; Limit definition of the derivative; Differentiability; Sum Rule; Constant Multiple Rule; Power Rule; Product Rule; Quotient Rule; Rates of change; Chain Rule; Implicit differentiation; Derivatives of trigonometric and inverse trigonometric functions; Derivatives of exponential and logarithmic functions; Related rates; Local and global maxima and minima; Extreme Value Theorem; Curve Sketching; Optimization; Linear approximation; Differentials; Mean Value Theorem; Antiderivatives; Simple motion problems.
Baccalaureate Core: This course fulfills the Baccalaureate Core requirement for the Mathematic Skills category. It does this by having students:

1. Identify situations that can be modeled mathematically.
2. Calculate and/or estimate the relevant variables and relations in a mathematical setting.
3. Critique the applicability of a mathematical approach or the validity of a mathematical conclusion.

These three Baccalaureate Core Learning Outcomes will be assessed through activities and on each of the exams (midterm and final) where there will be 1 – 2 problems explicitly written to pair with each of these 3 outcomes.

Course Specific Learning Outcomes: A successful student in Math 251 will be able to:

1. Calculate average and instantaneous rates of change and identify instantaneous rates of change with derivatives.
2. Apply ideas of differential calculus to motion problems (velocity, speed, and acceleration).
3. Apply the algebraic limit laws and the standard rules of differentiation including the chain rule to calculate particular limits and derivatives.
4. Use methods of calculus to solve maximum and minimum problems.
5. Use methods of calculus to determine the shapes of curves.

Grading: Your grade is determined by a syllabus quiz, online homework, recitation group work activities, a Skills Test, one midterm, and a cumulative final. There may also be extra credit based on participation in lecture.

The course will be graded as follows

- Syllabus Quiz 2%
- Homework 15%
- Recitation Activities (8 in total) and the “Practice Skills Test”: 18%
- Skills Test 10%
- Midterm 25%
- Final 30%

Your grade in the course will not be harder than:
A-/A 90% - 100%, B-/B/B+ 80% - 89.9%, C-/C/C+ 70% - 79.9%, D-/D/D+ 60%-69.9%, F 0%-59.9%.
Syllabus Quiz: A short (canvas) quiz testing your knowledge of this syllabus will be available during weeks 0 and 1. It’s due on Sunday, Sept. 30th.

Exams: There will be one midterm and a cumulative final exam. Calculators are NOT allowed on exams. The final does NOT replace the midterm. You are allowed both sides of one handwritten note card on each exam (3x5 inch for the midterm, 4x6 inch for the final). 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. Contact me to request an accommodation.

- Midterm: Friday, Oct. 26th
- Final Exam: Tuesday, Dec. 4th, 2-3:50pm

Group Work: 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. Many of the activities will come in two parts, with the second part only released during class. You are encouraged to work on the first part before class. 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 accepted on the following Monday as late for half-credit, but no later than that. If you scan and e-mail it to me please make sure it’s a single pdf file. Anything else may go unprocessed.

Skills Test: A 10-question basic differentiation Skills Test (some straightforward ones, some involving combinations of Product, Quotient, and/or Chain Rules) is given in week 8’s Friday and you just get whatever proportion of the credit that corresponds to your score (no partial credit given). You will not be given an opportunity to take it again. A practice Skills Test will be in week 7’s Friday (you get credit just for completion).

Homework: Homework is online (www.mymathlab.com) and can be accessed through Canvas. Homework cannot be done late unless there is an exceptional circumstance, which will dealt with on a case-by-case basis by your instructor.

Extra Credit – Lecture Participation: There may be up to a maximum of 5% of extra credit available in lecture. This will consist of up to 5 pop-discussion quizzes (where you can discuss the problems with your fellow students) given during some of the lectures.

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 Thursday, 27 Sept. going through Dead Week. The hours are MTWTh 9am-5pm, Fri 9am-4pm, and 7-10 pm on Sunday through Thursday evenings.
Course (Tentative) Calendar:

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<tr>
<th>Week</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
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<tr>
<td>0</td>
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<td>Activity 1 (review) &amp; 2.2</td>
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<td>1</td>
<td>2.3</td>
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<td>Activity 2 (1 is due) &amp; 2.5</td>
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<td>2</td>
<td>2.6</td>
<td>3.1</td>
<td>Activity 3 (2 is due) &amp; 3.2</td>
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<td>Activity 4 (3 is due) &amp; 3.5</td>
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<td>3.6</td>
<td>3.7</td>
<td>Activity 5 (4 is due) &amp; 3.8</td>
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<td>5</td>
<td>3.9</td>
<td>Review</td>
<td>Midterm (Act. 5 due)</td>
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<td>3.10</td>
<td>3.11</td>
<td>Activity 6</td>
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<td>Practice Skills Test (Act. 6 is due) &amp; Act. 7</td>
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<td>Veterans Day</td>
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<td>4.6</td>
<td>Thanksgiving</td>
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<td>10</td>
<td>4.9</td>
<td>Final Review</td>
<td>Activity 8 (due at final)</td>
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Notes: Syllabus Quiz due Sun. 9/30. Final is on Tuesday, Dec. 4th, at 2-3:50pm.