Instructor: Yonatan Katznelson  
Office: Baskin Engineering, 361B  
Phone: 459 - 1046  
Email: yorik@ucsc.edu, yonatan@soe.ucsc.edu


**Course Description:** This course covers differential calculus in one variable and its applications to Economics. Topics include limits, continuity, differentiation, linear approximation, elasticity, Taylor polynomials and optimization. For more details, please see the schedule of lectures.

**Reading:** The reading assignments listed with the lecture schedule are meant to be completed at least once *before* the corresponding lecture. This will make the discussion of the material in lecture much easier to follow. After the lecture, you should read the material again, in greater depth.

Some of the reading is assigned from the *Supplementary Notes*, which can be found on the review page of the course web site.

**Quizzes/Exams:** There will be six quizzes (in class), a midterm exam and a comprehensive final exam. The quiz/exam dates are listed in the lecture schedule that follows. Make-up quizzes will *not* be given. Your two lowest quiz scores will be dropped.

**Homework:** Assignments are listed in the lecture schedule. These assignments will *not* be collected or graded. However, the quiz problems and some of the exam problems will be similar, to homework problems.

Some of the homework is assigned from the *Review Questions*, which can be found on the review page of the course web site.

**Sections:** Sections are not mandatory, but are *highly recommended*. Mastering the material of this course requires practice and discussion, and in section you will have the opportunity to engage in both activities under the guidance of an experienced Teaching Assistant.

**Course grade:** Your (five highest) quiz scores contribute 25 points to your overall score in the class, the midterm contributes 25 points and the final exam contributes the remaining 50 points. Letter grades will correspond (approximately) to the following ranges:

<table>
<thead>
<tr>
<th>Overall Score</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 – 100</td>
<td>A– to A+</td>
</tr>
<tr>
<td>78 – 89</td>
<td>B– to B+;</td>
</tr>
<tr>
<td>65 – 77</td>
<td>C to C+</td>
</tr>
<tr>
<td>50 – 64</td>
<td>D</td>
</tr>
<tr>
<td>0 – 49</td>
<td>F</td>
</tr>
</tbody>
</table>

*To pass the class, your overall score must be 65 or above and you must score at least 40% on the final exam.*

**Students with disabilities:** If you qualify for classroom/exam accommodations because of a disability, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me as soon as possible, preferably within the first week of the quarter. Contact DRC by phone at *831-459-2089* or by email at *drc@ucsc.edu* for more information.
TIPS FOR SUCCESS

★ Come to all the lectures, and come prepared — read the assigned sections at least once before the lecture, so you have an idea of what we will be discussing in the lecture. You don’t have to read the material in-depth the first time through.

★ Read the material again after the lecture, this time in more depth. Read actively: take notes, make a list of questions to ask. Try working the examples in the book/supplementary notes on your own before reading the solutions.

★ Work on the homework after the second reading. Make a note of the problems that you don’t understand so that you can ask about them.

★ Ask questions: the more specific your question, the better and more helpful the answer is likely to be. You can ask questions in class, in section, and during office hours.

★ Attend sections regularly. You can prepare for section by making a list of the homework problems you find most challenging/confusing.

★ Study with friends for a few hours a week. Technical skills can be practiced alone, but concepts need to be discussed.

★ The standard for a 5-unit course at UCSC is 15 hours of studying a week. These 15 hours include the time for lectures and sections, but this still leaves close to 10 hours a week you should be spending with the material outside of class.

★ If you feel that you are getting lost, take action. Don’t wait and hope ‘it goes away’. Come to office hours or ask questions in class (or section) to clear up any confusion.

CHEATING:

Cheating in any form (using notes on quizzes or exams, copying from someone else, etc.) will not be tolerated. Any student caught cheating will be reported to the AMS and ECON departments and to his or her college provost. In most cases, students caught cheating will receive a failing grade. Students who help others cheat are also considered cheaters.

Cheating devalues everyone’s grades. You should not tolerate it either.
Lecture Schedule with Homework and Quiz/Exam Dates.

**Monday, 1-5:** Introduction. Mathematical models. Approximation.
*Reading:* Supplementary Note #1.

**Precalculus Review:** Chapters 3 and 4, SN #2 and #3.

*Homework.* Chapter 3, review problems: 3, 4, 5, 31, 34, 35, 37, 48, 49, 55.

Chapter 4, review problems: 5, 7, 12, 14, 17, 18, 21, 26, 35, 45, 47, 59, 62.

**Wednesday, 1-7:** Limits.
*Reading:* Section 10.1.

*Homework.* 10.1: 3, 5, 8, 11, 15, 18, 21, 25, 28, 36, 37, 40, 43.

**Friday, 1-9:** More limits; limits ‘at infinity’.
*Reading:* Section 10.2.

*Homework.* 10.2: 1, 2, 3, 7, 8, 11, 19, 21, 22, 24, 29, 35, 38, 54.

**Monday, 1-12:** Continuous functions.
*Reading:* Sections 10.3.

*Homework.* 10.3: 3, 6, 7, 11, 13, 16, 19, 25, 27, 28, 35.

**Wednesday, 1-14** Differentiable functions. *Quiz 1*
*Reading:* Section 11.1, SN #4.

*Homework.* 11.1: 1, 3, 5, 8, 12, 15, 25, 27.

**Friday, 1-16:** First rules of differentiation.
*Reading:* Section 11.2.

*Homework.* 11.2: 3, 6, 9, 17, 25, 33, 38, 43, 49, 54, 61, 69, 81, 85.

**Monday, 1-19:** *Martin Luther King day*

**Wednesday, 1-21:** Rate of change; linear approximation.
*Reading:* Section 11.3 and SN #5.

*Homework.* 11.3: 1, 6, 9, 11, 14, 17, 19, 23, 26, 28, 31.

**Friday, 1-23:** Linear approximation, continued. *Quiz 2*
*Reading:* SN #5.


**Monday, 1-26:** Product and quotient rules.
*Reading:* Section 11.4.


**Wednesday, 1-28:** The chain rule.
*Reading:* Section 11.5

*Homework.* 11.5: 2, 5, 9, 14, 21, 25, 28, 33, 36, 59, 66, 67.
**Friday, 1-30:** Applications.
*Reading:* Sections 11.2 - 11.5, SN #5.
*Homework:* RQ#3: 3, 4, 5, 6, 7; RQ#4: 3.

**Monday, 2-2:** Differentiating logarithm functions. **Quiz 3**
*Reading:* Section 12.1
*Homework.* 12.1: 2, 3, 6, 11, 15, 18, 22, 28, 29, 42, 43, 44, 50.

**Wednesday, 2-4:** Differentiating exponential functions.
*Reading:* Sections 12.2 and 12.5.
*Homework.* 12.2: 1, 4, 9, 12, , 16, 17, 20, 23, 28, 33, 41.

**Friday, 5-3:** Relative rate of change; Elasticity.
*Reading:* Section 12.3 and SN #6.
*Homework.* 12.3: 1, 2, 4, 7, 11, 14, 18, 27; RQ #5: 1, 2.

**Monday, 2-9:** **Midterm exam.**

**Wednesday, 2-11:** Higher order derivatives and Taylor polynomials.
*Reading:* Section 12.7 and SN #7.
*Homework.* 12.7: 1 – 12, 37, 38.

**Friday, 2-13:** Taylor polynomials (continued).
*Reading:* SN #7.
*Homework.* SN #7: 1 - 3; RQ #6: 1 - 4.

**Monday, 2-16:** **Presidents’ day**

**Wednesday, 2-18:** Relative extreme values and critical points. **Quiz 4**
*Reading:* Section 13.1.
*Homework.* 13.1: 1 - 8, 9, 12, 15, 18.

**Friday, 2-20:** The first derivative test.
*Reading:* Section 13.1.

**Monday, 2-23:** Global (absolute) extreme values.
*Reading:* Section 13.2.
*Homework.* 13.2: 1 - 9; RQ #7: 1, 2, 4.

**Wednesday, 2-25:** Concavity.
*Reading:* Section 13.3.
*Homework.* 13.3: 1, 4, 7, 10, 17, 20, 23, 39, 40.
Friday, 2-27: The second derivative test.
Reading: Section 13.4.
Homework. 13.4: 1 - 14.

Monday, 3-2: Asymptotes and curve sketching. Quiz 5
Reading: Section 13.5.
Homework. 13.5: 1, 4, 7, 10, 13, 27, 30, 35.

Wednesday, 3-4: Curve sketching, continued.
Reading: Section 13.5.
Homework. 13.5: 11, 15, 31, 37, 43.

Friday, 3-6: Applied optimization.
Reading: Section 13.6.
Homework. 13.6: 3, 4, 5, 8, 11; RQ #8: 1, 2.

Monday, 3-9: Applied optimization. Quiz 6
Reading: Section 13.6.
Homework. 13.6: 12, 13, 15, 18, 19; RQ #8: 3.

Wednesday, 3-11: Applied optimization.
Reading: Section 13.6.
Homework. 13.6: 13.6: 27, 28, 32, 38; RQ #8: 4, 5.

Friday, 3-13: Review
Reading: Your notes — come to class with questions.

Monday, 3-16: Review
Reading: Your notes — come to class with questions.

Tuesday, 3-17: Final Exam: 12:00 – 3:00 pm