

# AMS/ECON 11A: Math Methods for Economics I, Winter 2017.

MWF 2:40 – 3:45 pm, Baskin Engineering, 152

<https://ams011a-winter17-01.courses.soe.ucsc.edu/home>

**Instructor:** Yonatan Katznelson

**Office:** Baskin Engineering, 361B

**Office hours:** MWF 9:30 - 11:00 am

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**Required text:** *Introductory Mathematical Analysis for Business, Economics, etc.* 13<sup>th</sup> edition, *OR* the custom UCSC version of the 13<sup>th</sup> edition (blue paperback), by Haeussler, Paul and Wood.

**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. The lectures are prepared based on the assumption that the students have done the reading, so they will be significantly easier to follow if you have read the material in advance. 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 supplements/review page of the course web site.

**Quizzes:** There will be four short exams in class, one every other Friday, and a comprehensive final exam. The quiz/exam dates are listed in the lecture schedule that follows. Make-up quizzes will *not* be given, but your lowest score will be dropped. There will be a study guide posted for each quiz, and the TAs will go over these study guides in section.

**Homework:** Assignments are listed in the lecture schedule. These assignments will *not* be collected or graded. Working on the homework is crucial to mastering the material and succeed in the class.

**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. In addition, the TAs will review the study guides for the bi-weekly exams during sections.

**Special Accommodations:** UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please contact the Disability Resource Center, which offers services that are confidential and free of charge. Contact DRC by phone at **831-459-2089** or by email at **drc@ucsc.edu**. If you have an Accommodation Authorization Letter from the DRC, please submit it to me privately during my office hours or by appointment, preferably within the first two weeks of the quarter. At that time, I would also like us to discuss ways we can ensure your full participation in the course.

**Course grade:** Your (three highest) quiz scores contribute 60 percent to your overall score in the class and the final exam contributes 40 percent. Letter grades will correspond (approximately) to the following ranges:

Overall Score	Grade
90 – 100	A– to A+
80 – 89	B– to B+;
65 – 79	C to C+
60 - 64	C-
50 – 59	D
0 – 49	F

*To pass the class, your overall score must be 65 or above  
and you must score at least 50% on the final exam.*

***CHEATING:***

Cheating in any form (using unauthorized notes on tests 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 almost all cases, a student 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 Exam Dates.

**Monday, 1-9:** Introduction. Mathematical models.

*Reading:* Supplementary Note #1 (SN 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, 1-11:** Limits.

*Reading:* Section 10.1.

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

**Friday, 1-13:** 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, 1-16:**      *Holiday (Martin Luther King day)*

**Wednesday, 1-18:** Continuous functions.

*Reading:* Section 10.3.

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

**Friday, 1-20** Differentiable functions. *Quiz 1*

*Reading:* Section 11.1, SN 4.

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

**Monday, 1-23:** 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.

**Wednesday, 1-25:** 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, 1-27:** Linear approximation, continued.

*Reading:* SN 5.

*Homework.* 11.3: 16, 21, 25, 29.

**Monday, 1-30:** Product and quotient rules.

*Reading:* Section 11.4.

*Homework.* 11.4: 1, 4, 7, 10, 13, 20, 27, 31, 35, 43, 51, 52, 59, 62, 67.

**Wednesday, 2-1:** The chain rule.

*Reading:* Section 11.5

*Homework.* 11.5: 2, 5, 9, 14, 21, 25, 28, 33, 36, 59, 66, 67.

**Friday, 2-3:** Applications. **Quiz 2**

*Reading :* Sections 11.2 - 11.5, SN 5.

*Homework.* SN 5, Exercises 1 - 6.

**Monday, 2-6:** Differentiating logarithm and exponential functions.

*Reading:* Sections 12.1 and 12.2

*Homework.* 12.1: 3, 6, 11, 15, 18, 22, 28, 29, 43, 44, 50; 12.2: 1, 4, 9, 12, 16, 17, 20, 23, 33, 41.

**Wednesday, 2-8:** Relative rate of change; Elasticity.

*Reading:* Section 12.3 and SN 6.

*Homework.* 12.3: 1, 2, 4, 7, 11, 14.

**Friday, 2-10:** Elasticity, continued.

*Reading:* Section 12.3 and SN 6.

*Homework.* 12.3: 17, 18, 19, 21, 23, 25, 27.

**Monday, 2-13:** Higher order derivatives and Taylor polynomials.

*Reading:* Section 12.7 and SN 7.

*Homework.* 12.7: 1 - 20.

**Wednesday, 2-15:** Taylor polynomials, continued.

*Reading:* SN 7.

*Homework.* SN 7: 1 - 4.

**Friday, 2-17:** Relative extreme values and critical points. **Quiz 3**

*Reading:* Section 13.1.

*Homework.* 13.1: 1 - 8, 9, 12, 15, 18.

**Monday, 2-20:** **Holiday (Presidents day)**

**Wednesday, 2-22:** The first derivative test.

*Reading:* Section 13.1.

*Homework.* 13.1: 22, 25, 31, 37, 38, 42, 43, 51, 52, 69.

**Friday, 2-24:** Global (absolute) extreme values.

*Reading:* Section 13.2.

*Homework.* 13.2: 1 - 9.

**Monday, 2-27:** Concavity.

*Reading:* Section 13.3.

*Homework.* 13.3: 1, 4, 7, 10, 17, 20, 23, 39, 40.

**Wednesday, 3-1:** The second derivative test.

*Reading:* Section 13.4.

*Homework.* 13.4: 1 - 14.

**Friday, 3-3:** Curve sketching. *Quiz 4*

*Reading:* Section 13.5.

*Homework.* 13.5: 1, 4, 7, 10, 13, 27, 30, 35.

**Monday, 3-6:** Curve sketching, continued.

*Reading:* Section 13.5.

*Homework.* 13.5: 11, 15, 31, 37, 43.

**Wednesday, 3-8:** Applied optimization.

*Reading:* Section 13.6.

*Homework.* 13.6: 3, 4, 5, 8, 11.

**Friday, 3-10** Applied optimization.

*Reading:* Section 13.6.

*Homework.* 13.6: 12, 13, 15, 18, 19.

**Monday, 3-13:** Applied optimization.

*Reading:* Section 13.6.

*Homework.* 13.6: 13.6: 27, 28, 32, 38.

**Wednesday, 3-15:** Review

*Reading:* Your notes — come to class with questions.

**Friday, 3-17:** Review

*Reading:* Your notes — come to class with questions.

**Monday, 3-20:** *Final Exam: 8:00 – 11:00 am*