AMS/ECON 11B: Math Methods for Economics II, Winter 2018.

MWF 2:40 – 3:45 pm, Classroom Unit 001
https://ams011b-winter18-01.courses.soe.ucsc.edu/home

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

<u>**Course Description:**</u> This course covers integral calculus in one variable and differential calculus in several variables, with a focus on applications to Economics. Topics include antiderivatives, definite integrals, the fundamental theorem of calculus, elementary differential equations, partial derivatives, linear approximation, elasticity, and optimization. For more details, please see the lecture schedule.

<u>**Reading:**</u> 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 students have done the assigned reading and 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) and work on odd-numbered problems from the section(s) you have read, before moving on to the homework.

Some of the reading is assigned from the *Supplementary Notes*, which can be found on the Supplements page of the course website.

<u>**Homework:**</u> Weekly assignments are listed in the lecture schedule as well. These assignments will be collected in class every Friday.
⇒ *Late homework is not accepted. The lowest two homework scores will be dropped.* ⇐

<u>**Study Guides:**</u> There are numbered study guides on the Supplements page of the course website, arranged (more or less) by topic. These guides are meant to help you prepare for the exams. The TAs will review these guides in section.

<u>**Quizzes and Exams:**</u> There will be two midterm exams in class and a comprehensive final exam. The exam dates are listed in the lecture schedule that follows.

<u>**Sections:**</u> 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 particular, the TAs will review the homework and the study guides.
⇒ *TAs will take attendance in section. Regular attendance in section can help students' grades in borderline cases.* ⇐

<u>**Special Accommodations:**</u> 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 homework contributes 20 percent to your overall score in the class, the two midterms contribute 40 percent and the final exam contributes the remaining 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
<u>and</u> 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 cheaters. Cheating devalues everyone's grades—you shouldn't tolerate it either.

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 together with 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.

⋆ Take advantage of all the resources: lecture, section, MSI, office hours.

⋆ Study with friends for a few hours a week.

⋆ 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.

Lecture Schedule with Homework and Exam Dates.

Monday, 1-8: Introduction; Differentials and antiderivatives.

Reading: Sections 14.1 - 14.2.

Wednesday, 1-10: The *indefinite* integral.

Reading: Section 14.2.

Friday, 1-12: Application: integration with initial values.

Reading: Section 14.3.

Homework Assignment 1, Due Friday, 1-12

14.2: 2, 8, 10, 16, 20, 40, 44, 50.   14.3: 4, 10, 16, 20.

Monday, 1-15:   *MLK day*   (no classes)

Wednesday, 1-17: Integration formulas.

Reading: Section 14.4.

Friday, 1-19: More techniques of integration.

Reading: Section 14.5.

Homework Assignment 2, Due Friday, 1-19

14.4: 4, 8, 10, 20, 26, 30, 40, 56, 82.   14.5: 2, 4, 10, 16, 30.

Monday, 1-22: Summation and the definite integral.

Reading: SN #1; Sections 1.5, 14.6.

Wednesday, 1-24: The *definite* integral (cont.)

Reading: Section 14.6.

Friday, 1-26: The fundamental theorem of calculus.

Reading: Section 14.7.

Homework Assignment 3, Due Friday, 1-26

14.6: 4, 8, 12.   14.7: 6, 12, 18, 26, 52, 60, 62.

Monday, 1-29: *Midterm 1* *Study: HW assignments 1-3 and Study Guides 1-2.*

Wednesday, 1-31: Applications.

Reading: Section 14.9.

Friday, 2-2: More applications.

Reading: Section 14.10, 15.4.

Homework Assignment 4, Due Friday, 2-2

<u>14.9</u>: 4, 8, 28, 36, 60.   <u>14.10</u>: 2, 4, 6.   <u>15.4</u>: 2, 4, 8.

Monday, 2-5:   Table of integrals.

Reading: Sections 15.1 - 15.3 (*skim* 15.1 and 15.2).

Wednesday, 2-7: More examples and applications.

Reading: Section 15.3

Friday, 2-9: Separable differential equations.

Reading: Section 15.5

Homework Assignment 5, Due Friday, 2-9

<u>15.3</u>: 4, 6, 12, 22, 58 (hint: substitute $u = 1 - q$ and use formula #9).   <u>15.5</u>: 2, 6, 12, 22, 36.

Monday, 2-12: Applications

Reading: Sections 15.5 - 15.6

Wednesday, 2-14: Functions of several variables and their partial derivatives.

Reading: Section 17.1.

Friday, 2-16: Linear approximation.

Reading: Section 17.2 and SN #2.

Homework Assignment 6, Due Friday, 2-16

<u>15.6</u>: 2, 4, 12.   <u>17.1</u>: 2, 6, 8, 14, 32.   <u>17.2</u>: 4, 6, 12, 18, 24.

Monday, 2-19:   *Presidents day*   (no classes)

Wednesday, 2-21: Higher order partial derivatives, and quadratic approximation.

Reading: Section 17.4 and SN 2.

Friday, 2-23: Quadratic approximation (cont).

Reading: SN 2.

Homework Assignment 7, Due Friday, 2-23

<u>17.4</u>: 2, 4, 6, 10, 12.   <u>SN 2</u>: 1, 2, 4.

Monday, 2-26   *Midterm 2*   **_Study: HW assignments 4-6 and Study Guides 3-5._**

Wednesday, 2-28: Optimization in several variables I: first order conditions.

Reading: Section 17.6 and SN #3.

Friday, 3-2: Optimization II: the second derivative test.

Reading: Section 17.6; SN #3.

Homework Assignment 8, Due Friday, 3-2

<u>17.6</u>: 2, 4, 6, 10, 12, 14, 24, 26, 36.

Monday, 3-5: The chain rule and the envelope theorem.

Reading: Section 17.5; SN #4.

Wednesday, 3-7: Constrained optimization – Lagrange multiplier(s).

Reading: Section 17.7 and SN#5.

Friday, 3-9: Maximizing Utility.

Reading: Section 17.7 and SN#5.

Homework Assignment 9, Due Friday, 3-9

<u>17.7</u>: 2, 6, 8, 16, 18.   <u>SN 5</u>: 1(a), 4.

Monday, 3-12: Minimizing cost.

Reading: Section 17.7 and SN#5.

Wednesday, 3-14: Maximizing output.

Reading: SN #5.

Friday, 3-16 : Review

Reading: Your notes — come to class with questions.

Tuesday, 3-20:   *Final Exam: 4:00 – 7:00 pm*

Comment: The final exam will be comprehensive, with an emphasis on **untested material**. You can expect at least two constrained optimization problems similar to the ones in Study Guide 9 and the exercises at the end of Supplemental note #5.