AMS/ECON 11B: Math Methods for Economics II, Winter 2016.

MWF 9:30 – 10:40 pm, Classroom Unit 1

https://ams011b-winter16-01.courses.soe.ucsc.edu/home

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Required text: ***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.

Course Description: 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 — with and without constraints. For more details, please see the lecture schedule.

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 supplements/review page of the course web site.

Exams: There will be four short exams in class, one every other Friday, and a comprehensive final exam. The exam dates are listed in the lecture schedule that follows. Make-up (short) exams will ***not*** be given, but your lowest score will be dropped. There will be a study guide posted for each exam, 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 perhaps the most important thing you can do to master 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.

Course grade: Your (three highest) short exam scores contribute 45 percent to your overall score in the class and the final exam contributes another 45 percent. The remaining 10 percent come from attendance (5 percent) and participation (5 percent) — see the ***Top Hat*** information below for more details. Letter grades will correspond (approximately) to the following ranges:

Overall Score	Grade
90 – 100	A− to A+
79 – 89	B− to B+;
60 – 78	C to C+
50 – 59	D
0 – 49	F

To pass the class, your overall score must be 60 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.

Top Hat: All students in the class are expected to subscribe to Top Hat, which is an interactive classroom platform. To use Top Hat, you will need a cell phone, tablet or laptop. I will use Top Hat to record attendance and participation in lectures. When you subscribe, please use your full name (the same one the UCSC registrar uses) and your official UCSC email address.

The cost for Top Hat is $24 for one quarter, $36 for a year or $72 for a lifetime subscription. I will be using Top Hat for AMS/ECON 11B in the Spring (and the forseeable future) and other UCSC faculty also use it, so you may want to consider a year-long (or longer) subscription.

Attendance: I will take attendance during the first 10 minutes of each lecture. If you arrive later than that your attendance will *not* be recorded. There will be 28 lectures in all, and the attendance score will be determined as follows:

- 24 - 28 lectures: 5 points.
- 19 - 23 lectures: 4 points.
- 14 - 18 lectures: 3 points.
- 9 - 13 lectures: 2 points.
- 5 - 9 lectures: 1 point.
- 4 lectures or fewer: 0 points.

Participation: I will ask a couple of questions (using Top Hat) during most lectures. Your answers to these questions is how your participation will be measured. Correctness does *not* factor in to the participation score, but I will be tracking it and I may use the correctness score to help determine grades on the border at the end of the course (but only in the positive direction). The participation score will be determined as follows:

- 86% - 100% questions answered: 5 points.
- 71% - 85% questions answered: 4 points.
- 56% - 70% questions answered: 3 points.
- 41% - 55% questions answered: 2 points.
- 26% - 40% questions answered: 1 point.
- 25% or less: 0 points.

CHEATING:

Cheating in any form (using 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, 1-4: Introduction; Differentials and antiderivatives.

Reading: Sections 14.1 - 14.2.

Homework. 14.1: 1 - 10, 20, 21; 14.2: 3, 5, 6, 7.

Wednesday, 1-6: The ***indefinite*** integral.

Reading: Section 14.2.

Homework. 14.2: 10, 13, 17, 22, 26, 29, 33, 35, 41, 43, 51, 52.

Friday, 1-8: Application: integration with initial values.

Reading: Section 14.3.

Homework. 14.3: 1, 2, 3, 4, 5, 11, 12, 13, 14, 20.

Monday, 1-11: Integration formulas.

Reading: Section 14.4.

Homework. 14.4: 1, 3, 7, 12, 18, 21, 27, 32, 35, 39, 46, 51, 54, 57, 65, 74, 85.

Wednesday, 1-13: More techniques of integration.

Reading: Section 14.5.

Homework. 14.5: 1, 5, 10, 13, 16, 21, 27, 30, 34, 41, 53, 57, 59, 64, 67, 70.

Friday, 1-15: Summation ***Exam 1***

Reading: Section 1.5, SN #1.

Homework. SN #1: 1, 2, 4, 8, 9.

Monday, 1-18: ***Martin Luther King day***

Wednesday, 1-20: The ***definite*** integral.

Reading: Section 14.6.

Homework. 14.6: 1, 3, 5, 6, 7, 9, 11, 15.

Friday, 1-22: The fundamental theorem of calculus.

Reading: Section 14.7.

Homework. 14.7: 3, 8, 11, 15, 20, 25, 29, 38, 53, 55, 59, 61, 62.

Monday, 1-25: Applications.

Reading: Section 14.9.

Homework. 14.9: 3, 6, 15, 30, 43, 46, 51, 59, 60.

Wednesday, 1-27: More applications.

Reading: Section 14.10, 15.4.

Homework. 14.10: 1 - 4; 15.4: 1, 4, 7, 10, 11.

Friday, 1-29: Table of integrals. ***Exam 2***

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

Homework. 15.3: 1, 3, 6, 9, 12, 17, 21, 24, 31, 35, 43, 59, 62.

Monday, 2-1: More examples and applications.

Reading: Section 15.3

Homework. 15.3: 1, 3, 6, 9, 12, 17, 21, 24, 31, 35, 43, 59, 62.

Wednesday, 2-3: Separable differential equations

Reading: Section 15.5

Homework. 15.5: 1 - 6, 9, 10, 12, 15.

Friday, 2-5: Applications

Reading: Sections 15.5 - 15.6

Homework. 15.5: 21, 22, 25, 35.

Monday, 2-8: More applications

Reading: Section 15.6

Homework. 15.6: 1, 4, 5, 9, 11.

Wednesday, 2-10: Functions of several variables and their partial derivatives.

Reading: Section 17.1.

Homework. 17.1: 1 - 20, 38.

Friday, 2-12: Linear approximation and applications. ***Exam 3***

Reading: Section 17.2.

Homework. 17.2: 3, 4, 5, 6, 8, 11, 20, 23; RQ #6: 2, 3, 4.

Monday, 2-15: ***Presidents' day***

Wednesday, 2-17: Linear Taylor polynomials and higher order partial derivatives.

Reading: Section 17.4 and SN #2.

Homework. 17.4: 1 - 10, 17.

Friday, 2-19: Quadratic Taylor polynomials.

Reading: SN #2.

Homework. SN #2: 1 - 4; RQ #7: 1.

Monday, 2-22: Optimization in several variables I: first order conditions.

Reading: Section 17.6 and SN #3.

Homework. 17.6: 1 - 6; RQ #7: 2.

Wednesday, 2-24: Optimization II: the second derivative test.

Reading: Section 17.6; SN #3.

Homework. RQ #7: 3.

Friday, 2-26: The chain rule and the envelope theorem. ***Exam 4***

Reading: Section 17.5; SN #4.

Homework. 17.6: 7, 9, 11, 21, 23, 25, 26, 36; RQ #7: 5, 7; RQ #8: 4.

Monday, 2-29 Constrained optimization I.

Reading: Section 17.7 and SN#5.

Homework. 17.7: 1 - 6.

Wednesday, 3-2: Constrained optimization II.

Reading: Section 17.7 and SN#5.

Homework. 17.7: 13, 17, 18, 21.

Friday, 3-4: Applications and examples.

Reading: SN #5.

Homework. SN #5: 2; RQ # 8: #3.

Monday, 3-7 : Applications and examples.

Reading: SN #5.

Homework. SN #5: 3; RQ # 9: 2.

Wednesday, 3-9: Applications and examples.

Reading: SN #5.

Homework. SN #5: 1; RQ # 8: #2; RQ #9: 5.

Friday, 3-11: Review

Reading: Your notes — come to class with questions.

Thursday, 3-17: ***Final Exam: 8:00 – 11:00 am***