

MATH 118: Fundamental Principles of Calculus

Fall 2018

Course Description: Derivatives; extrema. The definite integral; the Fundamental Theorem of Calculus. Extrema and definite integrals for functions of several variables. Not available for a credit toward a degree in mathematics.

Prerequisite: Math 108 or Math 117

Textbook: Hughes-Hallett, et al. *Applied Calculus*, Fifth Edition (USC custom version).

In addition to the standard textbook, there is a supplemental Chapter 16, which should be given to you if you purchase the textbook.

And if you decide not to buy a textbook, I can later try to give you paper copies of Chapter 16.

See the item below for more information about the textbook.

WileyPlus: You can get access to full text of the textbook via [WileyPlus](#) (read only, not printable and requires internet access). Thus you are not required to buy a hard copy of the textbook, but you must have access to WileyPlus because homework assignments are given through WileyPlus. You may purchase an access code online from their website.

However if you choose to buy a hard copy of the textbook, make sure that it comes with an online access code to WileyPlus.

There is a 14-day free trial for WileyPlus. This is for the purpose of easy swapping or withdrawing.

Lecture Time and Location: Lecture 39444R, MWF 12pm-12:50pm, WPH B28

Instructor: Yuan Gao

Office: KAP 262B

Office Hours: Mon. 1pm-3pm, Wed. 1pm-2pm.

Email: gao403@usc.edu

Email policy:

- You may email me about math questions or other general issues related to the course. Please make sure that your statement or description is clear so that I can try to get back to you without much trouble.
- Please write the subject clearly including a brief description of the issue. When writing your content, please make sure to write down your full name (better with student ID) and the class section you are in.
- Please do NOT email with questions that can be answered in this syllabus.

TA: Jiyeon Park

TA Email: parkjiye@usc.edu

TA Office Hours: TBD, in Math Center.

Discussion Sections:

- Discussion 39445R, Tue, Thu 2pm-2:50pm, KAP 165
- Discussion 39446R, Tue, Thu 3pm-3:50pm, KAP 165

Math Center: The [Math Center](#) is located in KAP 263 and is open Monday to Thursday 8am to 7pm and Friday 8am to 5pm. TAs hold their office hours here and are able to help you with various kinds of math questions. However, it is closed during the first week of classes, and is only open as a study room during the second week (no TAs are schedule that week).

Grading Policy:

- Participation 5% (usually granted, but might be deducted if constantly absent from the course)
- Homework 10%

- Quizzes 10%
- Midterms 20% each (total 40%)
- Final Exam 35%
- Individual homework assignment, quiz, midterm or the final exam will not be curved. Only the total scores will be curved for better letter grade distribution. Curving usually improves your final grade (if applicable).

Homework:

- Assignments will be given through [WileyPlus](#). You can get access to WileyPlus homework links from Blackboard.
- Homework is usually due on Wednesdays at 8 pm PST, unless otherwise notified.
Most other sections put due on Tuesdays but I'm giving an extra day just in case there are some internet issues. However, it is encouraged that you finish homework earlier than the due date.
- Late homework is acceptable, but subject to score reduction: if you submit the homework 1 day late, you may only get 80% of the total points for questions which you answer correctly; and 2 more days late means only 50%.

Quizzes:

- Except the weeks of 1, 14, 15, 16, there is a quiz once a week, given during Thursday discussion sections. There will be 12 quizzes in total.
- Each quiz will consist of 2 problems related to the material covered in that week and the previous week, and should last about 15 minutes long.
- No notes, no books, no calculators will be allowed during the quizzes. (The problems should be designed so that the numbers are easy enough to manipulate without calculators.)

- Unless due to emergency or illness reasons, there is no make-up quiz, but the lowest two quiz grades will be dropped (thus 10 highest quiz grades will be counted). For a makeup quiz due to emergency or illness, an official document with designate signature is required as a proof.

Exam Policy:

- There will be three exams: 2 midterms and 1 final exam.
- The midterms are held in the lecture room during lecture hours. The tentative schedule is as follows: Midterm 1: Monday, Sep. 24th; Midterm 2: Friday, Oct. 26th.
- Unless due to emergency or illness, there is no make-up for any of the two midterm exams. If that unfortunately happens, you will have two choices to make up for the grade.
Option 1: you may take a make-up exam, which however will consists of different questions. To do this, you must present to me an official document with designate signature as a proof.
Option 2: you may choose to distribute the grade equally to the other midterm exam and the final exam.
- The final exam is cumulative, and is a common exam written by the Mathematics Department.
- Final exam time: Wednesday, December 5th, 2018, 2 pm to 4 pm. It is the University's policy that no common final exams may be taken early or skipped.
- There is ABSOLUTELY NO makeup for the final exam. If due to emergency or illness reasons you miss it, the only solution to this problem is that you will be given an IN(incomplete) for the course grade and will have to resolve the IN by taking the common final exam for this course in a subsequent semester.
- A simplified or standard scientific calculator can be used, but not a graphing calculator.
- No cheat sheets or other types of notes are allowed.

Academic Integrity:

- ABSOLUTELY NO CHEATING.
- No cellphones, laptops, or any other electronic devices with or without internet access which help you get an answer are permitted during a quiz or an exam.
- No one is allowed to communicate with others (including those outside the room) or steal others' solutions during a quiz or an exam.
- You are encouraged to collaborate on homework, but should not directly copy others' answers.
- If you need to know more about integrity (vs dishonesty), refer to [Trojan Integrity Guide](#).

Disability Services: Any student requesting accommodations based on a disability is required to register with [Disability Services and Programs \(DSP\)](#) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in 301 STU and is open 8:30 a.m.-5:00 p.m., Monday through Friday.

<https://dsp.usc.edu>

Phone: 213-740-0776

TDD only: 213-740-6948

Fax: 213-740-8216

Email: ability@usc.edu

Tentative Schedule: (Slightly flexible and subject to change depending on the overall progress)

- Week 1 (08/20 - 08/24): Introduction; Review of basics about functions.
Refer to sections: 1.1, 1.2, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9
No quiz. And there will be fewer homework assignments than the sections you are suggested to read.
- Week 2 (08/27 - 08/31): Rate of change; limit and continuity; derivatives; derivative as a function; the second derivative.

Refer to sections: 1.3, 2.1, 2.2, 2.3, 2.4, 2.5 as well as Focus on Theory: limits, continuity and the definition of the derivative.

- Week 3 (09/03 - 09/07): No class on Monday (Labor Day holiday). Use definition to calculate the derivative; linear approximation; estimate relative rate of change.
Refer to sections: 2.3, as well as Focus on Theory: limits, continuity and the definition of the derivative.
- Week 4 (09/10 - 09/14): Formulae for derivatives of elementary functions; the chain rule; the product and the quotient rules.
Refer to sections: 3.1, 3.2, 3.3, 3.4.
- Week 5 (09/17 - 09/21): Local minima and maxima; inflection points; global minima and maxima; Application of extrema: profit, cost, revenue, etc.
Refer to sections: 4.1, 4.2, 4.3, 4.4.
- Week 6 (09/24 - 09/28): Midterm 1 on Monday, Sep. 24th; logistic function; functions of two variables and partial derivatives.
Refer to sections: 4.7, 8.1, 8.3. (optional 8.2)
- Week 7 (10/01 - 10/05): Calculation of partial derivatives using differentiation rules; critical points; criteria for local maxima and minima.
Refer to sections: 8.4, 8.5.
- Week 8 (10/08 - 10/12): Global maxima and minima; constrained optimization: the setup; graphical approach; the method of Lagrange Multipliers.
Refer to sections: 8.5, 8.6.
- Week 9 (10/15 - 10/19): Accumulated change; Riemann sum and the definite integral; basic properties of the definite integral; area problems.
Refer to sections: 5.1, 5.2, 5.3, 5.4(brief) as well as Focus on Theory: Theorems about definite integrals.
- Week 10 (10/22 - 10/26): The Fundamental Theorem of Calculus; average value; Midterm 2 on Friday Oct. 26th.
Refer to sections: 5.5, 5.6.

- Week 11 (10/29 - 11/02): Anti-derivatives; the indefinite integral; calculating definite integrals by finding anti-derivatives.
Refer to sections: 6.1, 6.2, 6.3.
- Week 12 (11/05 - 11/09): Applications; substitution.
Refer to sections: 6.4, 6.5, 6.6.
- Week 13 (11/12 - 11/16): Integration by parts; the definite integral of a function of two variables.
Refer to section: 6.7, 16.1.
- Week 14 (11/19 - 11/23): only one class on Monday Nov. 19th, which will be more about integration of functions of two variables .
Refer to section: 16.1.
Thanksgiving Break (11/21 - 11/25). No quiz this week.
- Week 15 (11/26 - 11/30): Iterated integrals; Review
Refer to section: 16.2.
Last day of class is Friday, Nov. 30th. No quiz this week.
- Week 16: Study Days. Final Exam on Wednesday, December 5th, from 2pm to 4pm.