Math 122- Calculus for BA and Social Sciences
Spring 2019

Instructor: Michael Levet; mlevet (at) email (dot) sc (dot) edu
Course Website: Bookmark `people.math.sc.edu/mlevet/S19/Math122/`. Announcements and written homework will be posted here. You are responsible for checking the course website daily.

Office Hours: My regular office hours are MW from 10:30-11:30 and Tuesday from 1:00-2:00 in LeConte 400D. If my office hours are not convenient, I am happy to schedule an appointment. I encourage you to discuss the course material with me. Please note that office hours are a supplement for lecture, not a replacement for it. Students who miss class are solely responsible any material covered that day.

- **Office Hours vs. Email:** I am generally happy to discuss course logistics via email (e.g., grades, excused absences, scheduling appointments, etc.). However, email is usually not a conducive medium for tutoring. If you email me with a question about the homework (and you are certainly welcome to do so), I reserve the right to ask you to come to office hours with your question. Note that this does associate some risk with procrastination, in that you may not get your question answered until after the assignment due date (or after the quiz/exam). Please plan accordingly.
- **Email:** I stop checking email at 10:00 PM MTWR and do not check email on the weekends.

Course: TR 10:05-11:20, Horizon Parking Garage 210. Jan. 15-April 25, 2019.
Last Day to Drop Before Grade of 'W' Is Recorded: Tuesday, January 22.
Last Day to Drop Before Grade of 'WF' Is Recorded: Monday, March 4.
Breaks: Spring Break March 10-March 17.

Prerequisites: Qualification through the Math Placement Test; or grade of C or better in Math 111/111I or Math 115. **Note:** The prerequisite skills include proficiency with linear equations, exponential functions, and logarithms. We will begin with Chapter 1 of the course text, which serves as a **review** of this material.

Participation: All students are expected to show respect to every participant of the class, including other students, the instructor, and any guests visiting. This includes not talking over the instructor or your classmates.

Late Adds: Students who add the class after the first day are responsible for all material covered prior to their official enrollment, regardless of whether they were present in class. Additionally, students who add the class late are expected to take any quiz or exam on that day, even if it is their first day in the course.

Calculators: Officially, a graphing calculator is required for this course. The TI-83 or TI-84 is highly recommended, and such calculators will be permitted on quizzes and tests. The TI-NSpire, as well as any graphing calculator with a computer algebra system (CAS) like the TI-89 or similar, will not be allowed on quizzes or exams. Use of functionality on the calculator to compute derivatives or integrals will not receive credit on quizzes and exams.

Course Description: The fundamental idea of calculus is easy to state: add up the rates to obtain the change. This fundamental idea provides significant depth and application. After a brief review of precalculus, we will proceed to formalize the notion of rate of change, with the derivative. Differential calculus, the study of the derivative, provides numerous applications to almost every technical discipline, including optimization, probability and statistics, the hard sciences (chemistry, physics, and the life sciences), many fields of business, and computer science. Therefore, a strong foundation in differential calculus will pay dividends for the rest of your academic career. We will conclude the course with the study of integral calculus, which focuses on the accumulated effect of infinitesimal changes over a period of time.

A significant portion of the course will be devoted to discussing how to compute derivatives and integrals, as well as their applications. Note that you will be expected to **apply** the skills from class to problems you have not seen before. We will also discuss the underlying mathematical ideas to promote a deeper understanding of calculus. A third key goal of this course is to develop your critical thinking and problem solving skills, as well as your ability to communicate your thought process in a precise manner. This third goal is especially relevant

to everyone, regardless of degree track or goals.

Course Objectives: Formally, we have the following learning objectives:

- Students will gain proficiency working with various algebraic functions, including polynomials, exponentials, logarithms, rational functions, and derivatives and integrals of such functions.
- Students will apply the techniques from class to solve problems related to intercepts, rates of change, optimization, and accumulation problems. Beyond correctly modeling a problem, students will also correctly ascribe meaning to the various components of the model and the solution. Note that some of these problems will require multiple steps.
- Students will correctly solve the problems in the course with meaningful, correct, and complete work. Students will connect quantites that are equal using equal signs. Quantities that are not equal will not be connected by equal signs. Students will not use arrows in lieu of equal signs. **There is a difference between an arrow and an equal sign; do not misuse.**

Text: The course textbook is available as part of your WileyPlus subscrption. WileyPlus is **required** to complete the homework. The cheapest option is to purchase a WileyPlus access code for $79 via the WileyPlus website directly. Note that WileyPlus has a free 14-day grace period.

- To obtain an access code for $79, please visit `http://www.wiley.com/WileyCDA/Section/id-830823.html` and purchase access to *Applied Calculus, 6th Edition WileyPLUS Ecommerce*.
- Once you have an access code, please click `www.wileyplus.com/class/687045` to sign up for this section of the course. Alternatively, you can enter the course code manually, which is the last six digits of the URL: `687045`.

Given that most of your homework will be through WileyPlus, I strongly suggest you not take my section of this course if you do not intend to purchase WileyPlus. Historically, students who have below a 50% homework average fail the course.

Homework: Your learning in this class will ultimately come from making a good faith attempt to answer the homework questions. The homework problems will provide opportunities for you to apply the techniques and approaches from lecture. Note that the homework problems will sometimes require you to apply concepts in new ways or piece together multiple concepts. **Keep in mind that the point of lecture is to introduce the concepts and techniques, rather than exhaustive procedures for every possible problem. Start early enough on the homework, so that you can come to office hours with any questions.** There will be three types of homework assignments for this course. Your homework average counts for 15% of your final grade.

- **WileyPlus:** Almost all of your assignments will be completed online via WileyPlus. You will be provided with multiple attempts and problem solving resources. Your WileyPlus submissions will be graded for correctness. Given that WileyPlus is online, you will **only** be granted extensions in extenuating circumstances (e.g., hospitalization, death of a family member). WileyPlus problems will count towards your grade.
- **Study Guides:** The study guides are intended to provide additional practice problems, as well as provide an indication of the format for quizzes and exams. Note that **written solutions for study guides will not be provided**. So please **ask** about the problems you do not understand in advance; there will not be sufficient time to answer everyone's questions during review. Study guide problems will neither be collected nor graded.
- **Suggested Problems:** I will occasionally suggest problems, usually from the textbook. These problems will neither be collected, nor will they be graded.

Quizzes: There will be frequest quizzes, some of which may be unannounced. The quizzes will be closely connected to the homework and study guide problems, **emphasizing the more challenging material. NO MAKEUP QUIZZES WILL BE GIVEN.** To allow for the occasional absence, the lowest 10% of your quiz scores will be dropped. Your quiz average counts for 15% of your final grade.

Exams: There will be three midterm exams and a final. The midterms will be fairly traditional in that they will be closed book, closed note, and in class. Each midterm exam counts for 15% of your final grade.

Final Exam: The final exam period is scheduled for **Thursday May 2 at 9:00 AM in the usual classroom**. Note that the final exam period is mandatory and cannot be made up for discretionary reasons, including (but not limited to) a conflicting final exam at another institution or being out of town. The final exam counts for 25% of your final grade.

Grading:
Homework- 15%
Quizzes- 15%
Three Midterm Exams- 15% Each
Final Exam- 25%

Cutoffs of 90, 85, 80, 75, 70, 65, and 60 will correspond to an A, B+, B, C+, C, D+, and D respectively. Students earning lower than a 60 will receive an F. There will not be a curve. Extra credit does not exist.

Grade Disputes: Any grade dispute must be brought to my attention within one week of an assignment being returned. The only grade disputes that will be honored are those where the instructor made a mistake in grading. In particular, all points earned (or lost) are final, unless due to a mistake made by the instructor. In order for a grade dispute to be considered, you must submit your graded assignment, **along with a written justification**. The instructor will then consider the grade dispute and make a decision regarding how many (if any) points to award. The instructor's decision regarding any grade dispute is final. Note that I always welcome questions regarding the material, and I encourage you to discuss problems you missed with me.

Electronics and Cell Phone Policy: Electronic devices and cell phones should be silent, and not make any noise during class. Social media, YouTube, and games are distracting to students in class. If you wish to use your laptop for purposes other than note-taking, I ask that you sit in the back of the classroom so as not to distract others. If you are expecting an emergency phone call, please sit near the door and discreetly step out when you need to take the call.

During quizzes and exams, prohibited electronics including (but not limited to) cell phones and smart watches are required to be **in your backpack, and not on your person (including, but not limited to your pocket)**. Any student found to possess prohibited electronic devices on their persons during a quiz or exam will receive a 0 on that assignment, as a violation of the syllabus policy. Any student suspected of using such devices to cheat will also be referred to the Office of Academic Integrity; those found responsible will be subjected to the penalties described under the Honor Code section of the syllabus.

Honor Code: You are expected to know the Academic Code of Responsibility as it appears in the *Carolina Community: Student Policy Manual*. Much of what you will learn about mathematics will come from your discussions with your peers. You are welcome and encouraged to discuss the homework problems with each other and with me. **Your submissions must be written in your own words and reflect your understanding of the material.** If there are any questions regarding this policy, please ask me. Unless otherwise stated, all quizzes and exams are to be done individually, without the aid of books, notes, or electronic devices (except for approved calculators). **You will be required to clear the memory on your calculator before each quiz or exam. The insturctor reserves the right to verify that you have done so. Failure to clear the memory on your calculator constitutes an honor code violation.**

The usual penalty for those found responsible of honor code violations is receiving an F for the course. All honor code violations will be reported to the office of academic integrity. Students found responsible of honor code violations will be subject to a minimal penalty of -200% on the assignment. Responsibility for multiple honor code violations will be sufficient (though not necessary) grounds for a recommendation that an F for the course be issued. Finally, as noted in the Student Policy Manual, the maximum penalty for cheating on an assignment is expulsion from the University. These penalties apply both to copier and copiee. **Please do not cheat.** It is not worth it.

Students with Disabilities: If you have a disability, please register with Student Disability Services (LeConte

112A). You must be registered with Student Disability Services to receive accommodations. **You must talk to me before using accommodations.**

Attendance: Students are expected to attend class every day and stay for the entire duration of class. If a student misses class, they are responsible for the material that was covered. I will take attendance every day that I return an assignment or give a quiz. Students who are not present to take the quiz or pick up their graded assignment will be marked absent. Students who arrive excessively late or leave excessively early may also be marked absent. In accordance with USC's attendance policy, absence from more than 10% of class meetings **(whether excused or unexcused)** is considered excessive, and the instructor may choose to impose a grade penalty. Therefore, students missing more than **4 Days** of class **whether excused or unexcused** will have their final grade lowered by half a letter grade.

Students will not be allowed to make up an exam, except in extenuating circumstances (as described under Exams). There will be **NO MAKEUPS** for quizzes. **Please note:** In order for an absence to be considered excused, it is necessary that the student notifies the instructor at least 48 hours in advance or as soon as he or she is able, whichever comes first. The instructor reserves the right to require documentation. Note that non-emergency events (weddings, non-scholarship sports, vacations, etc.) will not be excused. **As a general rule, if you want your absence to be considered excused, you need to provide documentation and upfront, if at all possible.** Additionally, a swath of unexcused absences early in the semester does not warrant leniency later in the semester; budget your absences accordingly.

Note that these absences are intended for unforeseen circumstances such as illness, short-term personal emergencies, or absences due to legitimate university reasons (e.g., a Marine Science field trip). Exceptions to this policy will only be made for **extended and prolonged emergencies** such as extended hospitalizations or serious illness/death of a family member, in which cases the instructor reserves the right to require documentation. The final decision as to what constitutes an extended or prolonged emergency rests with the instructor.

Support: The following are good resources for seeking help:

- My office hours.
- SI Sessions.
- Free Tutoring in LC 105- MTWR from 10:00 AM-4:00 PM.
- Free Peer Tutoring via the Student Success Center.

Hints for Success:

- Attend SI. Our SI program has had tremendous impact on improving student mastery of the material, as well as student grades. You may attend any Math 122 SI Leader's sessions, not just those of our own SI Leader.
- This is a 3 credit hour course. Therefore, well-prepared should be spending 9-12 hours **outside of class** working on the material. Three of these hours should be spent in SI. Underprepared students may need to put in additional time to succeed. **Note:** I assign homework and quizzes with a 9-12 hour commitment in mind.
- When working homework problems, make several passes at them. A first pass at problems should be in an open-book environment by yourself, with the goal of working through the problems and learning the material. After working through the material on your own, then work with your peers and seek help in office hours. Your third (and subsequent) pass(es) should be in a closed book environment, with the goal of working through problems correctly and efficiently. Essentially, you want to simulate a quiz/test environment. **For this reason, math is not suitable to starting the night before.**
- After graded quizzes and tests are returned, go through them immediately (and seek help) to fix any weak areas. In this way, you are studying for exams as you go. So as the exam approaches, studying should be a matter of maintenance instead of re-teaching yourself an entire unit short-term.
- Ask for help. The instructor is here to help you succeed, and there are many additional resources for you to seek help (see under Support).

- **Do math.** Note that I said **do math**, NOT look at solutions or watch YouTube videos. The only way you will learn math is to work problems. This is not a spectator sport.
- Please see Bud Brown's hints for success.

Tentative Schedule: Please note that the course content is set by the department, and not the instructor.

Class #	Date	Section	Topic
1	Jan. 15	1.1-1.2	Functions, Linear Functions
2	Jan. 17	1.3-1.4	Rates of Change, Profit
3	Jan. 22	1.4-1.5	Supply and Demand, Exponential Functions
4	Jan. 24	1.6-1.7	Exponential Growth and Decay
5	Jan. 29	1.8-1.9	Function Transformations, Proportionality
6	Jan. 31	3.1-3.2	Derivative Rules (Power Rule, Exponentials, Logs)
7	Feb. 5		Review for Exam 1
8	Feb. 7		Exam 1
9	Feb. 12	3.3/3.4	Product, Quotient, Chain Rules
10	Feb. 14	2.1-2.2	Instantaneous Rate of Change
11	Feb. 19	2.3-2.4	Interpretations of First Derivative, Second Derivative
12	Feb. 21	2.5-4.1	Marginal Cost and Revenue, Local Maxima and Minima
13	Feb. 26	4.1	Review for Exam 2
14	Feb. 28		Exam 2
15	March 5	4.2-4.3	Inflection Points, Global Optimization
16	March 7	4.3-4.4	Global Optimization, Economics
17	March 19	6.2-6.3	Definite and Indefinite Integrals
18	March 21	6.6	U-Substitution
19	March 26	6.6	More U-Substitution
20	March 28	5.1/5.2	Distance and Accumulated Change
21	April 2	5.3/5.4	Interpretations of Definite Integral
22	April 4	5.6	Average Value
23	April 9		Review for Exam 3
24	April 11		Exam 3
25	April 16	6.4	Consumer and Producer Surplus
26	April 18		Review for Final Exam
27	April 23		Review for Final Exam
28	April 25		Review for Final Exam

Note: The instructor reserves the right to modify the syllabus as needed; particularly, as dictated by the interests of learning and fairness.