Class Meetings: MWF at 2:00-3:20 in AEB 320
Instructor: Stefan Patrikis (JWB 309)
Email: patrikis@math.utah.edu
Office Hours: Monday 4:00-5:00 and Wednesday 3:30-4:30 in JWB 309.
Learning Assistant: Lisa Penfold (penfold.lisa@gmail.com)
LA Office Hours: Tuesday 3:00-4:00pm, Friday 10:00-11:00am, in the lobby area outside JWB 121.
For information on purchasing the textbook, go to http://www.math.utah.edu/schedule/bookInfo/ (note: while the book is expensive, you will also use it for Calc II and Calc III)

Course Information: Math 1210 Calculus I is a 4 credit course.
Prerequisite Information: “C” or better in (((MATH 1050 AND 1060) OR MATH 1080 OR (MATH 1060 AND Accuplacer CLM score of 80+)) OR AP Calc AB score of 3+ OR Accuplacer CLM score of 90+ OR ACT Math score of 28+ OR SAT Math score of 630+.
Course Description: Calculus is the mathematical study of continuous, as opposed to discrete, phenomena. As such, it is one of the most fundamental tools of modern science. Its two main mechanisms are the derivative (rate of change) and the integral (total accumulation), both rooted in the central concept of limit. This course is an introduction to these three basic notions of calculus. It is not only indispensable preparation for other coursework in the sciences (and of course in mathematics), but is also a highlight of any serious liberal arts education.
List of Topics: Functions and their graphs, differentiation of polynomial, rational and trigonometric functions. Velocity and acceleration. Geometric applications of the derivative, minimization and maximization problems, the indefinite integral, and an introduction to differential equations. The definite integral and the Fundamental Theorem of Calculus.
Website: The course website, including all homework assignments, is
http://www.math.utah.edu/~patrikis/1210Fall2017/1210Fall2017main.html
(two is a link to the page in the official “Course Links” on CIS). I will send email notifications and correspondence to your UMail address ([u-number]@utah.edu); please check this email account regularly, as you are responsible for any of the messages sent there.

Formal Coursework and Grading: The following are the grade components and the percentage each contributes to your final grade:

• Homework Assignments (20%): Roughly three textbook sections are due most Fridays at the beginning of class. The homework will typically cover material covered up to and including the preceding Monday (with possibly a little spill-over to Wednesday). See the course website for each week’s assigned problems. In addition, each Friday in class there will be a one-problem mini-quiz closely related to the assigned homework problems. Each week’s homework grade will be determined as follows:
  – Completion and submission counts for 5 points.
  – The grader will select and grade 3 of the submitted homework problems, for a total of 15 points.
  – The one-problem mini-quiz in-class on Friday will be worth 5 points and graded along with the submitted homework.

Homework will only be accepted in hard-copy in class. The Friday quiz may be completed on leftover blank space on the homework you plan to submit, or you can staple an additional page with the quiz
onto your homework submission. During the quiz, you may refer to your completed homework but not to any other sources. No late homework will be accepted, unless accompanied by a doctor’s note or other verification of extenuating circumstance. There will be no make-ups for the Friday quizzes (under any circumstances).

- **Labs (10%)**: Every Thursday you will attend a lab section directed by a Learning Assistant (LA). These lab sections will be smaller classes in which you will work on lab worksheets in groups. The LA will be there to help guide you through the problems. The worksheets will typically be due at the end of the lab period. Half of the lab grade (5% of the total course grade) will be given for attendance, and the remaining grade (5% of the total course grade) will be based on the quality of the lab reports.

- **Midterm Exams (40% total, 20% each)**: There will be two 80-minute (entire class period) midterm exams. A practice exam, covering roughly the same material, will be posted one week prior to the midterm. The exam dates will be Monday October 2 and Monday November 6.

- **Final Exam (30%)**: A two-hour comprehensive exam will be given. As with the midterms, a practice final will be posted one week prior. Our final exam is scheduled for Monday December 11, 1:00-3:00 in AEB 320.

Final course letter grades will be determined by calculating your weighted average and then translating it to a letter: A is 90-100, A- is 85-89, B+ is 80-84, B is 75-79, B- is 70-74, C+ is 65-69, C is 60-64, C- is 55-59, D+ is 50-54, D is 45-49, D- is 40-44, E is anything below 40. I will reserve the right, but do not intend, to shift the grading scale for the entire class in your favor, so that lower numeric scores correspond to higher letter grades. I will not adjust final letter grades for individuals.

**Important**: The homework problems are meant to be representative of the kinds of problems you are expected to be able to solve; the homework you hand in is not necessarily meant to be sufficient practice for you to master the course material. If this were a high school course, with homework due every day, you might well be submitting twice as many problems per week. If you want to succeed in this course, you should regularly do many additional practice problems (make use of the odd-numbered problems in the textbook, since for these the answers are available in the back of the book). Just as important, you should be spreading your studying and practice throughout the week, not concentrating it in one day or night (eg, before the problem set is due): this will help you stay up-to-date with the lecture material, and it will give your brain a chance to process the material in between your study sessions (your brain is a remarkable thing, and this really happens!).

**Course Resources**:

- **The Textbook!** Our textbook is written to be read, not just to be used as a reference. I strongly encourage you to read it alongside the lectures.

- **Departmental Videos**: I also encourage you to watch the full set of lecture videos prepared by the department to supplement our course material. These can be found at http://www.math.utah.edu/lectures/. By combining the textbook, the lectures, and the videos, you will have an abundance of perspectives to complete your understanding of our course material. Also, if you are shaky on some of the prerequisites, I encourage you to review the departmental videos from the College Algebra and Trigonometry courses.

- **Your Classmates**: You can learn a great deal from discussing mathematics with your classmates, and you are certainly welcome to work on your homework together (solutions, however, must be written up independently). That said, it is important that these mathematical discussions not be one-sided: the only real way to learn mathematics is to struggle through it, and not simply to accept the fruit of someone else’s understanding. Be honest with yourself about this when working with classmates.
• **Tutoring Center & Computer Lab:** There is free tutoring in the T. Benny Rushing Mathematics Student Center (room 155, the lower level between JWB and LCB), as well as a computer lab. For more information see http://www.math.utah.edu/ugrad/tutoring.html

• **Private Tutoring:** University Tutoring Services, 330 SSB. There is also a list of tutors at the math department office JWB 233.

**Calculators & Other Electronic Devices:** No electronic assistance (including but not limited to calculators, computers, phones) will be allowed during exams or quizzes. You may use whatever you like to assist with your homework and studying, but it is crucial—both for your understanding and for your exam performance—that you use such tools as conceptual aids (e.g., generating many examples of graphs for you to analyze qualitatively) and not as computational crutches. During ordinary class periods, your telephone should be off and put away.

**Expected Learning Outcomes:** Upon successful completion of this course, a student should be able to:

1. Take limits of algebraic and trigonometric expressions of the form \(0/0\) (that simplify), non-zero number over 0, including limits that go to (positive or negative) infinity, limits that don’t exist and limits that are finite.

2. Use the limit definitions of derivative and definite integral for polynomial, rational and some trigonometric functions; understand definition of continuity.

3. Differentiate all polynomial, rational, radical, and trigonometric functions and compositions of those functions; perform implicit differentiation and compute higher order derivatives.

4. Use differentiation to find stationary, singular and inflection points, as well as domain and limit information to determine vertical and horizontal asymptotes, and then use all of that information to sketch the graph of a curve, \(y = f(x)\).

5. Apply differentiation to optimization and related rates problems.

6. Compute indefinite and definite integrals, using the power rule and basic u-substitution and the Fundamental Theorems of Calculus.

7. Apply the definite integral to compute area between two curves, volumes of solids of revolutions, arc length, surface area for surfaces of revolution and center of mass.

**Student Responsibilities:** All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, and I will do so, beginning with verbal warnings and progressing to dismissal from and class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee. http://regulations.utah.edu/academics/6-400.php

**ADA Statement:** The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability & Access, 162 Olpin Union Building, 801-581-5020. CDA will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability & Access.

**Addressing Sexual Misconduct:** Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to
the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veterans status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677 (COPS).

**Student Names and Personal Pronouns:** Class rosters are provided to the instructor with the students legal name as well as Preferred first name (if previously entered by you in the Student Profile section of your CIS account). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise me of any name or pronoun changes (and update CIS) so I can help create a learning environment in which you, your name, and your pronoun will be respected. If you need assistance getting your preferred name on your Ucard, please visit the LGBT Resource Center Room 409 in the Olpin Union Building, or email bpeacock@sa.utah.edu to schedule a time to drop by. The LGBT Resource Center hours are M-F 8am-5pm, and 8am-6pm on Tuesdays.

**Wellness:** Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student’s ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness at www.wellness.utah.edu or 801-581-7776.

**Course Roadmap Week-by-Week:**

**Week 1** Introduction, Chapters 0 (especially 0.7), 1.1, 1.3

**Week 2** Chapters 1.4-1.6. **Note, Friday Sep. 1st is the last day to drop**

**Week 3** Chapters 2.1-2.2 (Labor Day 9/4)

**Week 4** Chapters 2.3-2.5

**Week 5** Chapters 2.6-2.8

**Week 6** Chapters 2.9, 3.1, 3.2

**Week 7** Midterm 1, Monday October 2, covering all material up to 2.7. New material: Chapters 3.3-3.4

**Week 8** Fall Break

**Week 9** Chapters 3.5-3.7. **Note, Friday Oct. 20th is the last day to withdraw**

**Week 10** Chapter 3.8, 4.1, 4.2

**Week 11** Chapters 4.3, 4.4, exam review

**Week 12** Midterm 2, Monday November 6, covering all material up to 4.3. New material: 4.5, 5.1

**Week 13** Chapters 5.2-5.4

**Week 14** Chapters 5.5, 5.6 (Thanksgiving)

**Week 15** Chapters 5.7, 3.9 and other differential equations (a plug for 1220)

**Week 16** Review

**Week 17** Final Exam: Monday December 11, 1:00-3:00.