

**CALCULUS 1 (MATH 1210-019)
SPRING 2019 SYLLABUS**

Instructor: Liz Fedak
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Office: LCB 318

Office Hours: Monday 1:30-2:30 PM
Wednesday 1:30-2:30 PM

LA: Miles Haynes
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Office Hours: Monday 2:30-3:30 PM
Tuesday 3:00-4:00 PM

Class Meetings: MWF 11:50 AM-1:10 PM, ST 205

Lab Meetings: Section 030: H 11:50 AM-12:40 PM, LCB 219
Section 031: H 12:55 PM-1:45 PM, LCB 219

Course Information: 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. It 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 Materials: The following resources are used in this course.

- Textbook: Varberg, Purcell, and Rigdon, *Calculus with Differential Equations*, 9th ed.. This book can be purchased at <http://www.math.utah.edu/schedule/bookInfo/CalcBookInfo.pdf>.
- Canvas website: <https://utah.instructure.com/>.
- WebWork: <https://webwork3.math.utah.edu/webwork2/math1210spring2017-10/>. Additional information on WebWork syntax can be found at <http://www.math.utah.edu/online/ww/help/>.

Be sure to check the Canvas page and your UMail frequently!

Additional Resources: Students looking to improve their skills more quickly may wish to take advantage of the following university-provided resources.

- Math Tutoring Center: offers drop-in tutoring and a computer lab. Located in the underground passageway between JWB and LCB, Room 155. You can find more information at <http://math.utah.edu/ugrad/mathcenter.html>.

- University Tutoring Services: inexpensive private tutoring services provided by the university. Located in 330 SSB.
- Supplementary Notes and Past Exams: <http://www.math.utah.edu/online/1210/>.
- Online video lectures, available at <http://www.math.utah.edu/lectures/math1210.html>.

Overview: This is an introductory calculus course intended to prepare students for higher-level mathematics courses, as well as improving their problem-solving abilities in the minutia of day-to-day life. Students should expect to use this class to hone their learning process, practice universal skills such as focus and communication, and appreciate the ubiquitous role mathematics plays in understanding the world around them.

We intend to help students develop a deep understanding of calculus which will help greatly in higher-level courses. As such, this class will be focused around measuring understanding, not punishing mistakes. Students who make an effort to improve their understanding (communicating thoughts to others, asking questions, doing all work with integrity) should find this course a good match. Students focused on maximizing their grade with minimal effort (copying WebWork answers without understanding the process, not attending labs or lectures, cheating on tests) will not, since this material cannot be grasped with improper study. Several measures have been set in place to help or streamline one's learning process; these include peer discussion, the tutoring center, tutoring services, instructor and TA office hours, and the online course videos at www.math.utah.edu/lectures/math1210.html.

Grading: The grade percentage breaks down as follows:

Webwork Assignments	15%
Labs	15%
Midterm 1	15%
Midterm 2	15%
Midterm 3	15%
Final	25%

Final course letter grades will be determined from the final course percentage as follows:

E	D-	D	D+	C-	C	C+	B-	B	B+	A-	A
0-59	60-62	63-66	67-69	70-72	73-76	77-79	80-82	83-86	87-89	90-92	93-100

In addition, **your lowest two homework scores will be dropped, your lowest lab score will be dropped, and if your final grade is higher than your lowest midterm grade, your lowest midterm grade will be replaced by your final grade. This will ONLY apply to midterms the student has taken; if a student misses a midterm exam, their grade will remain zero.**

The instructor retains the right to modify this grading scheme during the course of the semester. Students will be notified of any adjustments.

Homework: Two types of homework will be assigned in this class: WebWork assignments (15%), and labs (15%).

- WebWork assignments (15%) will be due on Wednesdays at 11:59 PM when no exam is scheduled. For specific due dates and times, please consult the course calendar. Students may access WebWork assignments through the corresponding assignment on Canvas.

There will be 11 Webwork assignments plus one introductory assignment. The number of questions per assignment and hence the total points each assignment is worth will vary. The introductory Demo assignment is graded. **Your lowest 2 WebWork scores will be dropped.**

In WebWork, students get immediate feedback on their work, which aids in the learning process. Furthermore, this construction makes it easier to get a perfect score on the homework if one so desires. Be sure to ask questions if something doesn't make sense to you!

- Labs (15%) will be given in either of the lab sections on Thursday. Compared to the homework, lab problems can be more interesting, are designed to be done in peer discussion groups, and involve more writing. Getting the correct answer is only one part of the lab; labs will be graded on correctness of mathematical formatting ("math grammar") as well as correctness of English grammar in writing portions. Mathematical grammar includes writing in correct notation: not dropping limit signs, using equals signs properly, etc. **Since this is not an English course, the portion of English grammar that will be graded is limited to writing in complete sentences that begin with a capital letter and end with the proper form of punctuation.**

Lab assignments will be distributed by the TA on Thursdays and due at the end of lab period. During the one-hour lab session, students should join a group of four peers and discuss the problems between themselves and with the TA. Students should expect to finish the labs in one hour.

Exams: Midterm Exams (45%): Three 60-minute exams will be given during the semester. The first exam will be given on **Wednesday, February 6** and will cover material on Assignments 1-3; the second will be given on **Wednesday, March 6** and will cover Assignments 4-6; the third will be given on **Wednesday, April 10** and will cover Assignments 8-10. To facilitate studying, students will receive a practice exam in class and the LA will hold a review session the Thursday before the exam. **Students are expected to bring their uID to each exam; without their uID, a student will not be able to turn the exam in for credit. Students will also be allowed to construct a formula sheet on both sides of one 3" by 5" index card for use on each midterm exam.**

Final Exam (25%): One cumulative 120 minute exam will be given on **Friday, April 26 from 10:30 AM-12:30 PM**. The same information about studying and materials given above applies to the final as well, with the exception that students will be allowed two index cards instead of one.

Extra Credit Puzzles: Up to 5 puzzlehunt-style puzzles will be released in Canvas, one at a time. Your goal as a class will be to work together to solve all 5 puzzles. For each puzzle,

the ‘aha’ moment and extraction will be different, and each has an answer that is a word or phrase. All communication on puzzles must be on the corresponding Canvas thread. Upon solution of a puzzle (posting the answer in the Canvas thread), all students contributing ideas and helping solve the puzzle on the Canvas thread will get 1% added to their final grade. The next puzzle will be released immediately after the old one is solved.

This will be your only opportunities for extra credit.

Other Important Information.

- Students MUST use their U-mail email account ([u-number]@utah.edu) for all student-instructor email correspondence, and must send email to the instructor using the email address listed above. Check your U-mail regularly because all official class announcements will be sent through this email. Also, you should receive your WebWork login account information at this address at the beginning of the semester.
- If you are having difficulty with a Webwork problem and would like help from the instructor, please use the ‘email instructor’ button which is located on the problem page. This will send the instructor an email containing your question and a link which allows the instructor to view your specific problem and the previous answers you have input. This added information makes diagnosing your problem much easier.
- When asking about a problem, either via the Webwork “email instructor” button or discussion posts, please make sure to include the following information: (1) state the problem in your own words, (2) state your general strategy to solve the problem and any relevant intermediate computations, and (3), your answer. Often, you will find that if you take the time to write out the above information clearly, your mistake will become apparent. Also, the above information is important because the homework problems are randomized. No two students will get the same homework problems, so references to answers without the problem context will not be meaningful. When all three elements are included, the instructor can very often diagnose any problems in the student’s computations and/or strategy and suggest a correction. The instructor will most likely not supply a complete answer in reply. The goal of instructor interaction is to facilitate learning. It is the student’s responsibility to complete their own calculations to earn credit.
- Practice tests will be posted about a week prior to each exam. Practice exams will be similar in structure and format to the real exam. There are also exams and solutions from previous semesters which can be accessed through a link on the departmental webpage.
- The university suggests that you use Firefox, Chrome, or Safari to log in to Canvas, but not Internet Explorer. For any technical help with Canvas, you should contact the UOnline Helpdesk at (801) 581-6112. The Canvas interface (discussion posts, chat, etc.) should be used for Calculus I coursework only. The instructor moderates student activity and has the right to initiate disciplinary action in the event of inappropriate activity.

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>)

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 and understand the limit definitions of derivative for polynomial, rational and some trigonometric functions; understand the definition of continuity and consequences.
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 critical points and inflection points, the signs of the first and second derivatives, and domain and limit information to determine vertical and horizontal asymptotes. Then use all of that information to sketch the graph of $y = f(x)$.
5. Apply differentiation to optimization, related rates, linear approximation, and problems involving differentials.
6. Compute indefinite integrals and find antiderivatives, including finding constants of integration given initial conditions.
7. Compute definite integrals using the definition for simple polynomial functions. Compute definite integrals using the power rule, basic u-substitution, and the Fundamental Theorems of Calculus.
8. Apply the definite integral to compute area between two curves, volumes of solids of revolutions, arc length, surface area for surfaces of revolution, and work problems.

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.

Wellness Statement: 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.

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, veteran's 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 student's 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 UIDcard, 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.

Weekly Schedule: We cover the following:

Week	Chapters	Videos	Topics
1/7-1/11	1.1-1.3	1, 2, 2.5, 3	Slope of a Line, Limits, Limit Properties
1/14-1/18	1.4-1.6	4A-C, 5, 6	Limits at Infinity, Squeeze Theorem, Trigonometric Limits, Continuity
1/23-1/25	2.1-2.3	7, 8, 9, 10	Slope of a Curve, Derivatives, Derivative Rules
1/28-2/1	2.4-2.6	11, 12, 13	Derivatives of Trigonometric Functions, The Chain Rule, Higher Order Derivatives
2/4-2/8	2.7	14AB	MIDTERM 1 Implicit Differentiation
2/11-2/15	2.8-2.9	15AB, 15.5	Related Rates, Differentials
2/18-2/22	3.1-3.5	16AB, 17ABC, 18AB, 19AB, 20.5	Maxima and Minima, Local Extrema, Monotonicity, Sketching Graphs, Optimization
2/25-3/1	3.6-3.8	20, 21AB, 22	Bisection & Newton's Method, Mean Value Theorem, Antiderivatives
3/4-3/8	3.9, 4.1	23, 24AB	MIDTERM 2 Differential Equations, Area
3/11-3/15	–	–	SPRING BREAK
3/18-3/22	4.2-4.4	25AB, 26, 27	The Definite Integral, Fundamental Theorems of Calculus
3/25-3/29	4.5, 5.1	28ABC, 29AB	Mean Value Theorem for Integrals, Area
4/1-4/5	5.2-5.3	30ABCD	Volume of Solids
4/8-4/12	5.4, 5.5	31ABC, 32	MIDTERM 3 Length of a Plane Curve, Work
4/15-4/19	5.6, 4.6	33AB, 34AB	Moments & Center of Mass, Numerical Integration
4/22	–	–	Review for final, buffer time
4/26	–	–	FINAL EXAM (10:30 AM-12:30 PM)