

Calculus I
MA 231 – Spring 2022

Instructor: Dr. Tricia Phillips

Class Time: (A): MWF 9:30-10:30am (Olin 101); (B): MWF 11-12pm (Olin 101)

Office Hours: MW 8:30-9:20am and 12:45-1:45pm, F 8:30-9:20am, or by appointment

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Textbook/Access Code: *Apex Calculus 1 (Version 4.0)* by Hartman, Siemers, Heinold, et al. can be found online as a free PDF (click here). Edfinity access code - enroll in our course at: <https://edfinity.com/join/HYFRFCDC>

Course Description: This course is a rigorous introduction to single variable differential calculus. The course is intended to develop reasoning skills useful beyond the mathematics classroom. At no point in the course should you be satisfied with merely correctly doing a computation – you should be concerned with understanding the entire process that goes into the computation.

Course Objectives:

- To use mathematics to articulate and investigate questions about the world around you;
- To become proficient in standard techniques of differential calculus;
- To apply these techniques resourcefully to formulate and solve a variety of problems about quantities that change;
- To communicate your solutions to others;
- To make intelligent use of technology as an integral part of this process of formulation, solution, and communication.

General Education:

This course serves as a *Quantitative Analysis* course for the Explorations general education curriculum. As such, this course advocates a method of inquiry where you will:

- Frame a problem quantitatively by transferring information or data into a mathematical or statistical model or formal notation;
- Solve the problem using mathematical concepts and strategies, with the aid of technology as appropriate;
- Think critically about the quantitative results and interpret them in the context of the original problem; and
- Communicate your findings in written or oral format.

Grading Components:

60% Exams 1-4
20% Final Exam
5% Quizzes (lowest score dropped)
5% Worksheets/Participation
5% Edfinity Homework (lowest score dropped)
5% Project

Final Grades:

The final grade for this course will be assigned using the standard BSC scale:

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

Exams:

Exams 1-4 are cumulative in nature since calculus builds on previous material but will be focused on new material. The final exam will be comprehensive. For exams, you may not use cell phones, smart watches, devices with internet or email capabilities, or any calculator with symbolic differentiation and integration. A calculator check will be administered to ensure students have acceptable calculators if they wish to use their own, with departmental calculators also available. Mid-term grades will be solely based on Exam 1. If your final exam grade is higher than any regular exam grade, the lowest exam grade will be replaced with your final exam grade - having a growth mindset is valuable and will be rewarded in this way.

Quizzes:

Quizzes will consist of questions similar to those that may be asked on an exam. The sections that will be covered on each quiz are listed on the schedule and any changes will be announced in class. For quizzes, you may not use cell phones, smart watches, devices with internet or email capabilities, or any calculator with symbolic differentiation and integration. The first quiz is a practice quiz (won't count towards your grade) and will consist of questions found on the review sheet provided for this course. Your lowest quiz score will be dropped.

Worksheets/Participation:

Worksheets will be completed in class through discussion with peers and will be graded based on participation and completion. You are expected to be present and participate fully in these activities. These may be assigned as homework if extra time is needed on them. The grade scale will be as follows: 100 (present, fully engaged, work completed to satisfactory level), 80 (present, not fully engaged and/or work is mostly completed to satisfactory level), 0 (unexcused absence). Other activities may be assigned for a participation grade, as well, and will be announced in class or through email.

Online Homework (Edfinity):

You must have access to Edfinity for this course since part of your grade will be based on online homework. The homework assignments will open after new material is presented in class and due dates are listed on your Edfinity course page. Your lowest homework score will be dropped.

Project:

There will be a writing project and short (1-minute) presentation assigned in which you will reflect on your own experiences with and perceptions of mathematics, practice having a growth mindset, and research a mathematician from an underrepresented group in the field. Further instructions will be provided during the semester.

Make-up Policy:

No late work will be accepted. Make-ups for quizzes, worksheets, and exams will only be given for absences due to university activities such as athletics with a coach's letter, illness, or inclement weather/transportation issues for a commuter student and must be communicated to the instructor in advance. If you know you will have a conflict with any exam (including the

final), please contact me as soon as possible! *If you have extreme, unforeseen circumstances at the time of an exam (e.g. death in the family), please reach out to me as soon as you are able to make a plan.

Class Policies:

Be prepared for class everyday with a pen or pencil, notes, and your calculator. I expect you to show respect to the instructor and classmates by putting away distracting items such as cell phones, laptops, and coursework not related to our class. During group work, I expect everyone to contribute to the discussion (if you don't know how to answer the question, then *ask* a question). You may collaborate on solving homework problems and I hope you will learn from one another and benefit from working together. However, it is imperative that you understand any work you submit and are able to solve problems on your own on the exams. A good guideline is that, if you submit a homework problem for a grade, you should feel confident that you are able to explain your solution to the class.

I will respond to your emails as promptly as possible (usually within 24 hours, except on weekends). If you email me after 5pm, expect a response the next day unless it is over the weekend in which I will respond the beginning of the following week. Please check your email regularly and Moodle for updated class documents. Grades will be available for students on Moodle.

Quantitative Reasoning Center (Math Lab):

The Quantitative Reasoning Center is a free drop-in tutoring service located in Olin 103 and is open Sunday-Thursday afternoon/evenings. Be sure to sign in upon arrival so there is record of your attendance. The Math Lab schedule is available on Moodle.

Accessibility Services and Resources:

Students with a disability that qualify under the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act and require accommodations should be registered with BSC's Accessibility Office. If you are registered for academic accommodations, please make an appointment with me as soon as possible to discuss any accommodations that may be necessary. During this discussion you are not expected to disclose any details concerning your disability though you may do so at your discretion. If you have a disability but have not yet registered, please contact Dr. Sandra Foster, Assistant Director of Accessibility Services and Resources, at 205-226-7909 or smfoster@bsc.edu, or visit Norton 228. Keep in mind that no accommodation will be made unless and until the instructor receives official notification from the College.

Counseling:

BSC Counseling Services offers all students a safe place to discuss and resolve issues that interfere with personal and academic goals. All enrolled BSC students are eligible for counseling at no cost. Students can schedule an appointment by calling 205-226-4717. This service is found on the second floor of Norton Campus Center in the Counseling & Health Services suite next to Student Development and hours are Monday through Friday, 8:15am - 4:45pm.

Honor Code:

It is the responsibility of all faculty and students to be fully aware of the BSC Honor Code. It is a long-standing tradition of the College and is taken most seriously.

As a member of the student body of Birmingham-Southern College, I realize my responsibility

to the traditions of the institution, to my fellow students, and to myself. I recognize the significance of the Honor System, and I pledge that I will not lie, cheat, or steal as a member of the Birmingham-Southern College community.

If you have witnessed, been the victim of, or knowingly or unknowingly participated in an Honor Code violation, please talk to your instructor immediately. Immediate, honest disclosure of such violations is mandated by the Honor Code. Besides, in all such circumstances, talking to your instructor immediately will make the best of your situation.

A student found in violation of the Honor Code on an exam or assignment will receive a zero grade for that portion of the course and may be subject to further disciplinary action at the discretion of the Honor Council. Group activities constitute a significant part of student work in this course, and the Honor Code should not be construed as discouraging the kind of collaboration that is essential to such activities. It does, however, prohibit a student from signing a group assignment to which they made no contribution.

Title IX:

Birmingham-Southern College is committed to the creation and maintenance of a safe learning environment for students and the campus community. The College forbids any type of sexual or gender-based misconduct among its students, faculty, and staff. The College encourages all members of the academic community to report suspected sexual and gender-based misconduct to the appropriate authorities so that it can be investigated, remedied, and eliminated. BSC forbids retaliation against any person who has opposed, reported, or participated in an investigation concerning sexual or gender-based misconduct. See the BSC Title IX website (www.bsc.edu/titleix) for more information, including an online report form. If you or a peer have experienced such misconduct, there are faculty and staff members who are trained in supporting students by answering questions and helping them navigate this process. The list of advocates can be found along with other helpful resources on the Title IX website.

Success Tips: Hard work goes a long way and the more effort you put in, the more understanding you will have – that includes coming to class on time, fully participating in the activities of the day, and spending 1-2 hours outside of class for every hour spent in class doing homework problems, reviewing notes, and reading the textbook for understanding. Actively participating in class dialogue, rather than simply observing, is essential for understanding. Most importantly, ask questions – inside the classroom, in office hours, or over email. The earlier on you ask questions, the better, since concepts in mathematics build upon each other. Although **you are responsible for your own learning**, I encourage you to communicate with me so I know best how to help you succeed.

I offer the following pieces of advice for your consideration:

- Review notes and do math every day.
- Actively participate in class every day.
- Help each other.
- Analyze and understand your mistakes.
- Ask plenty of questions; go to office hours.
- Don't let yourself get behind.

Tentative Schedule

| Date | Textbook Section/Topic | Assignment Due |
|-----------|--|----------------------------------|
| W: Feb 2 | Course Introduction | |
| F: Feb 4 | 1.1: Intro to Limits | |
| M: Feb 7 | 1.3-1.4: Limit Rules, Calculator Check | Review Questions |
| W: Feb 9 | 1.3-1.4 (cont.): Limit Rules, 1.5: Limits and Continuity, Practice Quiz #0 | Edfinity 1.1 |
| F: Feb 11 | 1.6: Limits Involving Infinity, WS #1 | Edfinity 1.3-1.4 |
| M: Feb 14 | 1.6 (cont.): Limits Involving Infinity, 2.1a: Derivative at a Point | Edfinity 1.5 |
| W: Feb 16 | 2.1b: Tangent Line and Derivative Function, Quiz #1 (1.1, 1.3-1.5) | Edfinity 1.6 |
| F: Feb 18 | 2.1b (cont.): TL/Deriv. Func., WS #2 | Edfinity 2.1a |
| M: Feb 21 | 2.2: Interpret the Derivative, Project Introduction | Edfinity 2.1b |
| W: Feb 23 | Review | Edfinity 2.2 |
| F: Feb 25 | Exam 1 | |
| M: Feb 28 | 2.3a: Derivative Rules for Polys., Natural Exp., 2.4: Product/Quotient Rules | |
| W: Mar 2 | 2.4 (cont.) Product/Quotient, 2.5a: Chain Rule | Exam 1 Reflection |
| F: Mar 4 | 2.5b: Derivative Rule Combinations, WS #3 | Edfinity 2.3a |
| M: Mar 7 | 2.6: Implicit Differentiation, WS #4 | Edfinity 2.4 |
| W: Mar 9 | 4.2: Related Rates, Quiz #2 (2.3a, 2.4), WS #5 | Edfinity 2.5 |
| F: Mar 11 | 4.2 (cont.): Related Rates, WS #5 (cont.) | Edfinity 2.6 |
| M: Mar 14 | Review | Edfinity 4.2 |
| W: Mar 16 | Exam 2 | |
| F: Mar 18 | 2.3b-2.7 Trig/Inv./Exp. Derivs. | Project & Powerpoint Slide |
| Mar 21-25 | <i>Spring Break - no classes</i> | |
| M: Mar 28 | 3.1a, 3.3: Local Extrema and First Derivative Test | Edfinity 2.3b, Exam 2 Reflection |
| W: Mar 30 | 3.4: Second Derivative and Concavity, Quiz #3 (2.3b-2.7) | |
| F: Apr 1 | 3.5: Curve Sketching | Edfinity 3.1, 3.3 |
| M: Apr 4 | 3.5 (cont.): Curve Sketching, WS #6 | Edfinity 3.4 |
| W: Apr 6 | 3.1b: Global Maximum/Minimum, Quiz #4 (3.1a, 3.3, 3.4) | |
| F: Apr 8 | 4.3: Optimization, WS #7 | Edfinity 3.5 |
| M: Apr 11 | 4.3 (cont.): Optimization, WS #7 (cont.) | Edfinity 3.1b |
| W: Apr 13 | Review | Edfinity 4.3 |
| F: Apr 15 | <i>Good Friday - no classes</i> | |
| M: Apr 18 | Exam 3 | |
| W: Apr 20 | 5.3a: Area Under the Curve | |
| F: Apr 22 | 5.3b: Riemann Sums | Exam 3 Reflection |
| M: Apr 25 | 5.2a: Definite Integral, WS #8 | |
| W: Apr 27 | 5.2b: Integral Properties, Quiz #5 (5.3), WS #8 (cont.) | Edfinity 5.3 |
| F: Apr 29 | 5.1: Antiderivative and Indefinite Integral | Edfinity 5.2a |
| M: May 2 | 5.4a: Fundamental Theorem of Calculus | Edfinity 5.2b |
| W: May 4 | 5.4b: Interpretation of Definite Integral, Review | Edfinity 5.1, Edfinity 5.4a |
| F: May 6 | Exam 4 (no 5.4b) | |
| M: May 9 | Project Presentations (1 minute), Review | Edfinity 5.4b, Exam 4 Reflection |
| W: May 11 | Final Exam @ 9am-12pm CT (Section A) | |
| M: May 16 | Final Exam @ 9am-12pm CT (Section B) | |

***Note: Syllabus subject to change; announcements will be made in class and/or email.**