MA 231 – Calculus I

Fall 2022

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**Office Hours:** M, W 12:30-1:50, T 1:00-3:20

**Course Overview**: This course is required for the mathematics major and the mathematics minor and also satisfies the general education requirement in Quantitative Analysis (QA). This is the first in a three-course calculus sequence. In this course, we will study limits, differential calculus, the definition of the definite integral, and the fundamental theorem of calculus. We will use calculus to describe, understand, and solve real problems and interpret the results.

**Catalog Description**: A course in calculus emphasizing graphical, numerical, analytical, and descriptive points of view. Topics include functions, derivatives, definite integrals, and the Fundamental Theorem of Calculus. A primary learning objective is a working knowledge of differentiation. Not open to students who have passed MA 232 or equivalent.

**Calculus I Student Learning Outcomes**:

By the end of this course you should be able to:

* Use mathematics to articulate and investigate questions about the world around you;
* Demonstrate proficiency in the standard techniques of differential calculus;
* Demonstrate understanding of the definite integral and the Fundamental Theorem of Calculus;
* Apply calculus resourcefully to formulate and solve a variety of problems about quantities that change in disciplines such as biology, business, chemistry, economics, mathematics, and physics;
* Communicate your solutions to others; and
* Make intelligent use of technology as an integral part of this process of formulation, solution, and communication.

**General Education Student Learning Outcomes in** **Quantitative Problem Solving:**

By the end of this course you should be able to:

* 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 where appropriate;
* think critically about the quantitative results and interpret the results in the context of the original problem; and
* communicate findings in written or oral format.

**Course Objectives and Assessment:** The goal for this course is for students to demonstrate mastery of 53 specific course objectives. These objectives are divided into *concepts* and *skills*. Objectives will be assessed using the scale:

* M = mastery
* P = progressing
* NP = no meaningful progress has been shown.

Students only receive credit for objectives on which they receive a mastery, or “M,” grade, and the overall course grade is based mainly on the percentage of objectives a student has mastered.

Students may continue to work to master objectives throughout the term, and no penalty is incurred for initially failing to master an objective.

For most objectives, students may elect for alternative assessment methods beyond written work. These may include demonstrating mastery at the blackboard or orally in office hours, via Teams, or potentially via recordings. Projects may also be offered as alternative assessments at the discretion of the instructor.

**Concepts:** “Concept” objectives are those that require students to demonstrate that they understand some fundamental idea, or concept, from the course material. These often involve graphs and typically involve writing answers in complete sentences. They usually involve minimal, if any, computation or algebra.

**Skills:** “Skills” objectives are those that require students to execute some particular mathematical technique. These are objectives where students are asked to do mathematics by applying the concepts they have learned. They will typically involve calculation, algebra, or analytic methods. They may involve using appropriate technology, such as Wolfram Alpha, to solve a problem.

**Text:** *APEX Calculus 1****,*** *Version 4.0*, by Gregory Hartman.This an open-source textbook that may be downloaded for free here: <http://www.apexcalculus.com/>.

**Class Notes:** The amount of class time spent with the instructor lecturing will be kept to a minimum. Students will be provided with “notes skeletons” for each lecture. Students must complete the appropriate class notes before they will be allowed to take the relevant assessments.

**Homework:** Homework will be assigned regularly. Students must complete the appropriate homework before they will be allowed to take the relevant assessments. We will be using Edfinity for *MA 231 Fall 2022 Barton*. To enroll, please follow the steps below:

1. If you already have an Edfinity account from a previous course, please sign into it. Otherwise, go to step 2.
2. Go to the following registration link: <https://edfinity.com/join/WABETGYQ>
3. You will be prompted to pay (if applicable) and enroll in our section.
4. Start working on your assignments :)

**Project:** One group project will be assigned during the term. Details will be provided in class.

**Graded Work:** Final course grades will be determined by:

* Homework: 5%
* Project: 5%
* Percentage of objectives mastered: 90%.

**Final Exam:** The final exam will be an all in-class exam. It is the last chance for students to master all objectives in the course. Final Exams: Sect. A, Thursday, Dec. 8, 9-12; Sect. B, Monday, Dec. 5, 1-4.

**Academic Accessibility and Accommodations:** 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 Olin 210. Keep in mind that no accommodation will be made unless and until the instructor receives official notification from the College.

**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.

**Honor Code:** It is the responsibility of every student to be familiar with and abide by the BSC Honor Code throughout this course. Any student who is convicted of an honor code violation involving this class will receive a zero on the relevant assignment, project, or test.

**Math Lab:** The Math Lab, located in Olin 103, provides free walk-in tutoring on Sundays from 2 to 6 pm and Mondays through Thursdays from 4 to 8 pm. For other needs, such as different times or virtual tutoring, email a tutor. The complete schedule and list of Math Lab tutors can be found [here](https://bsc.edu/academics/math/math-lab.html).

**Mask Policy:** Students are expected to abide by the College’s guidelines for mask-wearing. Should circumstances change, the instructor reserves the right to require masks in class.

**Note:** This syllabus is subject to changes announced in class, via email, or via the course Moodle pages. It is your responsibility to be aware of changes announced to this syllabus or to the course/exam schedule.