Instructor: Dr. Eric Bancroft

Office: HAL 213B

Office hours: Office hours will be posted outside my office, on my web page, and on myGCC.

I am also available to meet by appointment (you don’t need an appointment during regular office hours). Feel free to stop by my office any time - if I can’t meet when you come by then we’ll set up another time to meet.

E-mail address: EDBancroft@gcc.edu

Phone: 724-458-3844 (homework questions should be asked in person or via e-mail).

Web page: http://www2.gcc.edu/dept/math/faculty/BancroftED/

Grades, some announcements, and some homework assignments will be posted in myGCC: https://my.gcc.edu/

Class meeting time and location:

- Section A: MWF 12:00-12:50 p.m. and T 1:00-1:50 p.m. in HAL 210.
- Section B: MWRF 1:00-1:50 p.m. in HAL 210.


Prerequisites: High school mathematics including algebra, analytic geometry and trigonometry.

Course Description: “A first course in calculus that assumes no prior study of the subject. Topics include: limits and continuity, differentiation, curve sketching, definite and indefinite integration, and applications. This course fulfills in part the Information Literacy (IL) requirement for the Mathematics major. Students may not receive credit for Math 141 and 161.”

Course Objectives / Student Learning Outcomes: Upon completion of the course, the successful student will:

1. Understand the underlying mathematical concepts related to the topics listed above, and be able to explain those concepts. Relates to Department Goals 1, 2, and 3. To be assessed through homework, readings, and tests.

2. Be able to apply these mathematical concepts to solve problems that depend upon an understanding of those concepts, and present solutions to difficult problems in a logically consistent manner with sufficient explanations and rationale for each step in the solution process. Relates to Department Goals 1, 2, and 3. To be assessed through homework, readings, and tests.

3. Have further developed their ability to think logically and to solve problems, as demonstrated by solving increasingly complex problem sets. Relates to Department Goals 1, 2, and 3. To be assessed through homework and tests.
(4) Be able to demonstrate their ability to use the computer algebra system Mathematica. Relates to Department Goal 4. To be assessed through Mathematica assignments.

**Grading:** Final letter grades will assigned as follows:

- A+ [98, 100]
- A [93, 98]
- A- [90, 93]
- B+ [88, 90]
- B [83, 88]
- B- [80, 83]
- C+ [78, 80]
- C [73, 78]
- C- [70, 73]
- D+ [68, 70]
- D [63, 68]
- D- [60, 63]
- F [0, 60]

**Note:** You should not expect any rounding or curves!

The final grade score is determined as follows:

**-3% – 0% Attendance and Participation:** It is in your best interest to routinely attend class and to be on time, and attendance is expected for the entire scheduled class time. However, a detailed record of attendance will be taken only if I begin to observe that you are absent on a regular basis (coming to class more than 5 minutes late or leaving early also counts as an absence). “Good attendance” is defined as having four or fewer unexcused absences. I will deduct 0.5% from your overall course grade for every recorded unexcused absence over four. Additionally, the college reserves the right to withdraw a student who misses more than 25% of the class meetings for any reason(s).

Any student who is using electronic devices in a manner that I deem inappropriate (this includes text messaging or using your laptop for anything unrelated to the class), sleeping, doing work for other classes, talking/socializing, reading the paper, or otherwise being disruptive or disrespectful may be penalized up to 1% of their overall course grade per occurrence and may also be asked to leave for the remainder of that day. Inappropriate use of your laptop may also result in the loss of your privilege to use it in class on non-required days.

The maximum cumulative penalty for poor attendance/participation is 3% of the overall course grade.

**35% Homework:** There will be three types of homework assigned:

1. **Pre-lecture (10%)**: You will read each section in the book and answer 2-5 short essay questions and work 2-5 relatively simple introductory problems before I lecture on the section in class. These assignments, along with due dates, will be posted in myGCC; formatting instructions will be posted on the web page. Pre-lecture assignments are completed outside of class, and your answers to these questions must be submitted in myGCC. Late or improperly formatted/submitted assignments will not be accepted! Your lowest two pre-lecture assignment scores will be dropped.

   The goal of these pre-lecture assignments is for you to have a basic familiarity with the material before you get to class so that we don’t have to spend as much of our time going over basic definitions and introductory examples, but rather solve more advanced problems, answer your questions, and give you a deeper understanding of the material. The essay questions will be graded on an “all or nothing” scale - you will receive credit for a question as long as you make a reasonable attempt to answer it. In other words, you don’t have to get the right answer, but you do have to try and show me that you did your best to read and understand the section. The introductory problems will be graded on both completeness and correctness.

2. **Post-lecture (7.5%)**: The post-lecture homework is intended to give you practice solving medium-difficulty problems and applying the concepts discussed in class. Problems will be assigned in class and/or on the web page; if you miss a class, it is your responsibility to get any assignments from one of your classmates. These problems will due every Friday unless I say otherwise. Specific due dates along with the sections covered will be posted in myGCC. The majority of these problems will be graded on completeness, but a small random selection of problems will graded for correctness. Your lowest post-lecture homework grade will be dropped.

3. **Problems Days (17.5%)**: Most Fridays we will have a “problems day” during which you will work on more difficult problems related to topics from the last week. You will be assigned to a group of 3-4 people and work with those people on the problem set during class time. I will change the groups every few weeks. These problems will be collected and graded in more detail, due dates will vary depending on the assignment: sometimes I will collect them the same day, sometimes I will give you additional time to work on them outside of class. Your lowest problems day homework grade will be dropped.
All pre-lecture assignments are individual assignments. You are encouraged to work on the post-lecture assignments in groups of 2 or 3 people. Guidelines for problems day assignments worked on outside of class will vary - if the assignment doesn’t explicitly address this, then it is your responsibility to seek out clarification from me. For all homework assignments, any work that you turn in must be your own, and you must be able to explain any problem to me if I ask you to. Copying a solution from another student, the Internet, another calculus book, a solutions manual, or any other source is considered cheating!

Late homework of any kind will not be accepted unless you have an excused absence. If you have a non-emergency excused absence, then you must make arrangements with me prior to the assignment’s due date.

15% Mathematica: You will have five assignments in which you will use the computer algebra system Mathematica to solve problems related to the topics covered in class. Mathematica assignments will be posted on the class web page. You will have at least 5 days to work on these assignments. Start and due dates will be posted in myGCC and on the web page. I will only help with Mathematica if you come to me in person - not over e-mail or phone. Extensions for Mathematica assignments will be given only if you have an excused absence. Further instructions and guidelines will be posted on my web page.

35% Tests: There will be three in-class tests. The tests will consist of problems similar to what you will see on the homework as well as conceptual problems. Details on missed/make-up tests are below. Your tests will be weighted as follows: your best test is worth 15%, your worst is 7.5%, the other is 12.5%. No tests will be dropped! Calculators will not be allowed on tests unless I say otherwise. If I do allow calculators on a test, only dedicated, non-symbolic calculators will be permitted (i.e., no cell phones, tablets, laptops, etc, or TI-89, 92, Voyager, Nspire, or equivalent calculators).

15% Final exam: The final exam will be comprehensive. All students must take the final. As stated in the Bulletin, final exams must be administered according to the time scheduled by the Registrar’s office, and cannot be changed to suit the convenience of the student. It is your responsibility to schedule your travel and work plans accordingly. Students with a Provost’s excused absence will receive permission to reschedule their final exam.

Test and Final Exam Dates: These dates are predetermined and are as follows:
Test 1: Wednesday, February 20. (Note: This is the day before spring break begins.)
Test 2: Friday, March 22. (Note: This is the day before Easter recess begins.)
Test 3: Wednesday, May 1.
Final Exam: Section A: Friday, May 10 at 2 p.m. Section B: Monday, May 13 at 2 p.m.

Make-up Test Policy: Make-up tests for excused absences will be of the same length and degree of difficulty as the in-class test. Anticipated excused test absences must be brought to my attention in advance of the test date. These include authorized college activities or duties (excused by the Provost’s office or its designees) or any other anticipated Provost-excused absence. Emergency excused test absences must be reported to me as soon as possible, but not more than two days after the return to class. Examples of emergency absences are: illness or injury (certified by the Health and Wellness Center or an attending physician), death of an immediate family member (documented appropriately and notification sent to the Office of Student Life and Learning at studentlife@gcc.edu).

Make-ups for oversleeping, car trouble, or any other excuse not approved by the college: If you miss a test and do not have an approved excuse, you must contact me and schedule to take the make-up test within 24 hours of the end class on the day the test was given, at my earliest convenience. Otherwise, you will receive a score of zero for the missed test. Make-up tests for unexcused absences may be more difficult than the in-class test. Only one unexcused make-up will be allowed per student. No unexcused make-ups will be given for the final exam!

If you miss a make-up and do not have an excused or emergency reason for doing so, then you will receive a score of zero for the test you missed.

Grade Records: Grades for all assignments will be posted in myGCC. If you have questions about the grading of any assignment, let me know no later than the second class after it is handed back. Disputed or incorrect
grades must be brought to my attention within 7 days of being posted or by the beginning of the final exam, whichever is shorter, or they will stand as recorded.

Cheating: Cheating in any form will not be tolerated, and any suspected instances of cheating will be investigated. As a student of Grove City College, you have agreed to abide by the Honesty in Learning policy as outlined in the GCC Bulletin. Additional details regarding what I consider to be cheating in various situations are linked on the class web page. It is your responsibility be certain about what is or isn’t allowed on an assignment before working on it or turning it in, and to ask me if you need clarification.

Students With Disabilities: Reasonable accommodations will be made for students with verifiable disabilities. Students must first contact the Office of Student Life and Learning at 724-458-2700. Once accommodations have been approved, the student must then contact the instructor if he/she wishes to take advantage of the available accommodations.

Course Schedule: This is a tentative schedule of what we will cover each week.

Week 1: Syllabus, introduction, review (Appendices A-D, §§1.1-1.3), §1.7.
Week 2: Limits (§§1.5-1.7).
Week 3: Limits (cont.), infinite limits (§3.4), continuity (§1.8).
Week 4: Introduction to derivatives (§§2.1-2.2), differentiation formulae (§§2.3-2.4).
Week 5: Differentiation formulae (cont.), test 1, spring break.
Week 6: Differentiation techniques (§§2.5-2.6), applications of differentiation (§§2.8-2.9).
Week 7: Applications of differentiation (cont.), Max/min problems (§3.1).
Week 8: Max/min problems (cont.), mean value theorem (§3.2), curve sketching (§§3.3, 3.5-3.6).
Week 9: Curve sketching (cont.), test 2.
Week 10: Easter recess.
Week 11: Easter recess, optimization problems (§3.7).
Week 12: Newton’s method (§3.8), antiderivatives and integrals (§§3.9, 4.1-4.2, 4.4).
Week 13: Antiderivatives and integrals (cont.), Fundamental Theorem (§§4.3-4.4).
Week 14: Substitution rule (§4.5), area between curves (§5.1).
Week 15: Volumes (§§5.2-5.3), test 3.
Week 16: Volumes (cont.).