



MATH 102: Calculus II

Spring 2020

Mt. Holyoke College

Course Information:

Lecture Times:

- *Section 01*: MWF, 11:00 AM–12:15 PM
- *Section 02*: MWF, 2:55–4:10 PM

Lecture Location: 402 Clapp Lab

Instructor:

Nathan Gray

Office: 417 Clapp Lab

Office Hours: TBA

Email: ngray@mt holyoke . edu

Prerequisites: A passing grade in MATH 101, or its equivalent, is required.

Textbook (required): Hughes-Hallett, Gleason, McCallum et al., *Calculus: Single Variable*, 7th ed., Wiley, 2017. After reviewing chapters 5 and 6, we will cover much of chapters 7–11 as well as sections 4.7 and 4.8.

Course Description: Calculus is one of the greatest achievements of human thought, worthy of study in its own right, yet it also is the essential language of technical applications (e.g., biology, economics, physics, political science, psychology). It is the study of how quantities change. We model quantities by using functions (such as polynomial, rational, exponential, logarithmic, and trigonometric functions), and we apply techniques of calculus to study such functions.

This is the second of two semester-long courses in single-variable calculus. The first course (MATH 101) introduced our two main tools: the derivative and the definite integral. This second course uses those two tools (especially the definite integral) in both mathematics and applications. Topics include: techniques of integration; l'Hospital's rule and indeterminate forms; improper integrals; parametric equations; polar coordinates and polar curves; applications of integration; sequences and series; power series; Taylor series; and (time permitting) differential equations.

Homework, Quizzes, Exams:

Homework: There will be (almost) weekly homework assignments. The two lowest homework grades will be dropped at the end of the semester.

Students are expected to complete the assignments on their own. However, collaboration with classmates *before the write-up* is acceptable and encouraged, as long as each student writes and submits their own work. Collaboration during the write-up stage of an assignment, or handing in an assignment that is practically identical to a fellow classmate's work, is cheating and may result in a grade of zero for the assignment.

Quizzes: There will be eight in-class quizzes. Each quiz is closed-book and closed-notes, will be given at the beginning of a Friday lecture, and will be on some of the latest material covered.* The lowest two quiz grades will be dropped at the end of the semester. Quiz dates:

*The exact coverage of any upcoming quiz will be announced during lecture.

- Quiz 1: Jan. 31
- Quiz 2: Feb. 7
- Quiz 3: Feb. 14
- Quiz 4: Mar. 6
- Quiz 5: Mar. 13
- Quiz 6: Apr. 10
- Quiz 7: Apr. 17
- Quiz 8: Apr. 24.

Exams: There will be two in-class exams and a cumulative, self-scheduled final exam. Exam dates:

- Exam 1: Feb. 21
- Exam 2: Mar. 27
- Final Exam: May 1–5.

Grading Policy: Every student's grades are a reflection of the student's mastery of the course material and the student's ability to communicate that mastery through written work.

Course grades will be based on homework, quizzes, and exams. Table 1 gives the weights of these grade items. Students may check their grades on the course Moodle site throughout the semester. **Warning: The grades displayed on Moodle are raw scores.**

Earning 90%, 80%, and 70% of the total points in the course will result in course letter grades *no stricter than* A–, B–, and C–, respectively. The boundaries (cut-offs) between letter grades may be relaxed at the instructor's discretion, depending on the distribution of course numeric grades. This grading scheme rewards hard work, leaving little room for miraculous recovery.

Table 1. Course Grades

Category	Grade Basis	Weight (each)	Weight (total)
Homework	lowest two dropped		20%
Quizzes (×8)	lowest two dropped		15%
Exams (×2)		20%	40%
Final Exam		25%	25%

Course Load: Mt. Holyoke College complies with federal regulations defining a credit hour. For this course, MHC expects all students to have 12 hours per week of academic engaged time throughout the semester; besides lectures, this weekly time amounts to *9 hours of additional academic work*.

Schedule: A tentative schedule can be found on the course Moodle site. Students should consult the schedule and read the relevant material *before* it is presented in lecture. The schedule will be updated frequently.

Course Help: Studying mathematics can be difficult. Here is some advice:

- Read the relevant material in the textbook before lecture. Attend lecture, and then begin the homework assignment.
- Work on every homework assignment *on your own* for the first few days that it is assigned. During this period, you should not be discussing your solutions with others. Once you have completed all that you can, spend the last few days discussing the problems with one or more classmates to get further help.
- Attend the evening Group Study sessions, and work in a small group while there.*
- **Do not search for homework solutions online.** This creates a dangerous habit; it also violates the MHC Honor Code.
- Attend office hours.
- Study regularly with at least one fellow classmate.

Attendance, Make-Up Policy: Students should understand the importance of attending lectures and doing the assigned work. Some remarks:

- A student who misses a lecture is responsible for any announcements made during that time, and they should consult with a classmate to determine what they missed. The instructor will ignore emails that are of the form, "I had to miss class today. What did you cover?"
- **Late homework is not accepted.**

*Students are allowed and encouraged to attend *any* of the MATH 102 Group Study sessions.

- A legitimate absence due to a recognized MHC-related activity, a religious holiday, a verifiable illness, or an emergency will be reviewed on an individual basis. If a student must miss an exam, they must obtain permission from the instructor in advance.

Electronics/Technology Policy: Except for *non-programmable scientific calculators*, all electronic devices are banned from use.

For homework, students are encouraged to use Wolfram Alpha* or Mathematica for computational purposes (e.g., checking answers) or for visualization of graphs of functions seen in the course.

Disability Accommodations: Mt. Holyoke College is committed to providing equitable access to learning opportunities for all students. If you have a disability and seek accommodations, please make an appointment with the instructor within the first two weeks of the semester so that appropriate arrangements can be made; documentation from the AccessAbility Services Office is required. You can contact AccessAbility Services in Mary Lyon Hall, or at accessability-services@mtholyoke.edu, or at (413) 538-2634.

Liberal Education: An important part of any liberal education is learning to use abstract thinking and symbolic (mathematical) language to solve practical problems. Calculus is one of the pillars of modern mathematical thought and has diverse applications. In this course, students will be exposed to theoretical concepts at the heart of calculus and examples of real-world applications.

Scholastic Dishonesty: This includes: cheating on exams or quizzes; taking or using past/present exam materials without instructor permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain grades dishonestly. ***All students are expected to follow the Honor Code.*** If it is determined that a student has cheated, they may be given a grade of F for the course and may face additional sanctions from MHC.

*<https://www.wolframalpha.com/examples/Calculus.html>