



## MATH 231: Multivariable Calculus

Fall 2022

Oberlin College

**Lectures:**

MWF, 10:00–10:50 AM  
King 337

**Instructor:**

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King 204  
Office Hours: TBA

**Prerequisites:** A passing grade in MATH 134, or its equivalent, is required.

**Textbook (required):** *Multivariable Calculus*, 9th ed., Stewart et al., Cengage Learning, 2021. We will cover much of Chapters 12–16.

**Course Description:** In this course, we will extend the concepts and techniques covered in single-variable calculus (MATH 133, 134) by studying functions of two or more variables. The main topics include:

- (Chapter 12) vectors; lines and planes; quadric surfaces
- (Chapter 14) continuity; partial differentiation; gradients; directional derivatives; local/global extrema
- (Chapter 15) double integrals (rectangular and polar coordinates); triple integrals (rectangular, cylindrical, and spherical coordinates); applications; change of variables
- (Chapter 16) vector fields; line integrals; Fundamental Theorem for Line Integrals; Green's Theorem.

Time permitting, additional topics include: surface integrals; surface integrals over parameterized surfaces; Stokes' Theorem; the Divergence Theorem.

**Course Load:** Oberlin College complies with federal regulations defining a credit hour. In this course, all students are expected to have 12 hours per week of academically engaged time throughout the semester. This amounts to 9 hours per week of additional academic work outside of lectures.

**Grade Items:**

**Homework:** There will be weekly homework assignments. The two lowest homework grades will be dropped at the end of the semester. Assignments must be submitted through Gradescope (see page 2).

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. Late homework is not accepted.

**Exams:** There will be two midterm exams and a cumulative final exam.

**Grading Policy:** Course grades will be based on homework, quizzes, and exams. 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.

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.

### Technology:

*Google Drive Folder:* All course materials will be posted there.

*Gradescope:* This course will use the website Gradescope in order to provide fast and accurate feedback on students' work.\* Homework will be submitted and graded through Gradescope. Once the grades are posted, students will be notified immediately so that they can log in and see their feedback. Each student may also submit regrade requests if they feel that the grader has made a mistake.

After the instructor registers students into Gradescope, students should log in using their Oberlin email addresses. The initial password for each student can be changed at [gradescope.com/reset\\_password](http://gradescope.com/reset_password). The same link can be used if students need to set their passwords for the first time.

*Calculators:* All electronic devices, except for *non-programmable scientific calculators*, are banned from use during exams.

**Schedule:** A tentative schedule can be found in the course Google Drive folder. It will be updated frequently.

**Attendance, Make-Up Policy:** Students should understand the importance of attending lectures and doing the assigned work. A student who misses a lecture is responsible for any announcements made during that time. To determine what they missed, they should talk to a classmate. **Late homework is not accepted.** A legitimate absence due to a recognized Oberlin-related activity, a religious holiday, a verifiable illness, or an emergency will be reviewed on an individual basis. Concerning the exams, if a student must miss one, then they must obtain permission from the instructor in advance.

With that said, ***students who are sick should notify the instructor and stay home.***

**Accommodations:** Oberlin College is committed to providing equitable access to learning opportunities for all students. If you have a disability and are seeking accommodations, please contact the Disability Resources at the Center for Student Success. All requests for accommodations must go through that office. You should also contact the instructor *at least* two weeks before the accommodations are needed.

**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; 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 Oberlin College.

Category	Grade Basis	Weight (each)	Weight (total)
Homework	lowest 2 dropped	30%	
Exams (×2)		20%	40%
Final Exam			30%
<b>Total</b>			100%

\*[www.gradescope.com](http://www.gradescope.com)

**Course Help:** Studying mathematics, especially at the 200-level, can be difficult. Here is some advice:

*Reading:* The relevant material should be read *before* lecture. Try to read and understand every statement mentioned in all of the examples. If necessary, reread the same material after lecture.

*Homework:* Begin it immediately after lecture, doing as much as you can *on your own* for the first few days that it is assigned. During this period, you should not be discussing 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. ***Do not search for homework solutions online.*** This creates a destructive habit; it also violates the Oberlin Honor Code.

*HOOT:* Meet with our HOOT (dedicated tutor). Their schedule will be made available at the beginning of the semester.

*Office hours:* Attend them when you can.

*Additional practice:* Do additional problems from the textbook for practice. Also, see the PDFs of solved problems for additional examples.