Math 231 - 90 Calculus III Summer 1 2026 - Syllabus

Instructor : Richard Bartels, PhD

Contact Information : rbartels@trincoll.edu

Office Hours: Tues. and Thurs. 12:15 pm - 1:30 pm, Fri. 12:00 pm - 1:30 pm
or by appointment (email to set up)

Note: Office hours will be held over Zoom.

Lecture : MTWR 10:00 am - 12:05 pm

Note: Lectures will be held live over Zoom.

Link to course Moodle page: `https://moodle.trincoll.edu/course/view.php?id=12503`

Note: I will post my lecture notes on the course Moodle page.

Textbook : OpenStax Calculus, Volume 3

Link to textbook: `https://openstax.org/details/books/calculus-volume-3`

Note: We will cover most of chapters 2-6 of the online OpenStax Calculus textbook, Volume 3. There are review exercises at the end of each chapter. Also, there is an answer key for review exercises at the bottom of the table of contents on the page linked above.

Grading : Your final letter grade for the course will be determined from your numerical percentage grade in the standard way (..., B 83-86, B^+ 87-89, A^- 90-92,...) using the following breakdown.

Attendance/Participation :	5%
Homework :	25%
3 Exams :	15% each
Final Exam :	25%

Note: Since this is a 200-level course, it is possible to earn a grade of $A+$. However, an $A+$ grade is only awarded to students who demonstrate exceptional ability and work, as well as near-perfect grades on exams and assignments.

Important Dates :

Mon, May 18	First class
Tues, May 19	Add/Drop period ends
Mon, May 25	No class. Make-up class on Friday, May 29
Tues, June 2	Last day to withdraw from Summer 1 courses
Thurs, June 18	Last class, final exam

Please read and sign the following declaration regarding academic integrity:

In accordance with Article II of the Trinity College Student Integrity Contract, I hereby pledge that the papers, exams, and other academic exercises I submit for this course will represent my own work; that I will properly acknowledge and attribute any and all information and ideas that I have used from other sources; and that no collaboration unauthorized by the instructor of the course will occur in the course of its completion.

Signature: _____ Date: _____

Office Hours : You are encouraged to attend office hours whenever you have questions, especially when you don't understand how to solve a problem from a past exam. You are always welcome to ask me about homework problems and course material. If you are unable to make my regularly scheduled office hours, please email me to set up an appointment.

Exams : There will be **three midterm exams** during the second hour of class on the following dates: **Thursday, May 28, Thursday, June 4,** and **Thursday, June 11.** There is also a cumulative **final exam** during the entire class on **Thursday, June 18.** During each exam, you may only use a scientific or simple function calculator. You may not use any other resources during an exam. You are expected to email me your exam solution as a scanned pdf at the end of the exam.

Expectations:

- You should expect to spend at least 8-12 hours per week outside of class working on homework assignments, reviewing lecture notes, reading the online textbook, and working on practice problems.
- You are expected to participate in lecture. The focus should be on keeping up with and understanding what is going on, not on taking notes. Ask questions when you don't understand something! If you fall too far behind, take notes and come to office hours.
- You need a grade of at least $C-$ in Math 132 - Calculus II (or equivalent) to take this course. You should have a solid understanding of differential and integral calculus of one variable, covered in Math 131 and Math 132.

Learning Goals: In this course, we will extend differential and integral calculus of one independent and one dependent variable to differential and integral calculus of multiple independent and dependent variables. In particular, this allows us to apply calculus to engineering and physics problems in three-dimensional space. Here are the topics in chapters 2-6 of the textbook that we will study in this course.

- (Ch 2 and Ch 3) Vector algebra in three-dimensional space, dot-product, cross-product, lines and planes in three-dimensional space, vector-valued functions.
- (Ch 4) Functions of two and three variables, limits and continuity, partial derivatives, directional derivatives and differentiability, chain rule, gradient, extreme value problems.
- (Ch 5) Double integrals in rectangular and polar coordinates, triple integrals in rectangular, cylindrical, and spherical coordinates.
- (Ch 6) Vector fields, line integrals, conservative vector fields, fundamental theorem of line integrals, Green's theorem, surface integrals, Stokes' theorem.

Homework : There are three homework assignments for the course. Homework will be assigned at the beginning of each week and is due Tuesday of the following week. You are encouraged to work on homework together, but you must write your own solutions.

Note: You are not allowed to use an AI generator, such as Chat GPT, to complete any work in this course. The information derived from AI generators is based on previous published materials. Therefore, using them without citing the underlying source is plagerism.

Students with Accommodations : Trinity College is committed to creating an inclusive and accessible learning environment consistent with the Americans with Disabilities Act. Students with disabilities who may need some accommodation in order to fully participate in this class are urged to contact the Student Accessibility Resource Center, as soon as possible, to explore what arrangements need to be made to assure access.

If you have approval for academic accommodations, please notify me by the end of week two of classes. For those students with accommodations approved after the start of the semester, a minimum of 10 days' notice is required. Please be sure to meet with me privately to discuss implementation.

Student Accessibility Resources can be reached by emailing SARC@trincoll.edu

Academic Integrity : In accordance with the Trinity College Student Integrity Contract, students are expected to abide by the highest standards of intellectual honesty in all academic exercises. Intellectual honesty assumes that student do their own work and that they credit properly those upon whose work and thought they draw. It is the responsibility of each student to make sure that they are fully aware of what constitutes intellectually honest work in every exam, quiz, homework, or other academic exercise submitted for evaluation in a course at Trinity College.

Supplemental materials: Here are links to the online 3-D graphing calculators GeoGebra and Desmos.

- Geogebra: `https://www.geogebra.org/3d?lang=en`
- Desmos: `https://www.desmos.com/3d`

Attendance Policy : You are expected to attend and participate in lectures.

In the event of an unforeseen unavoidable circumstance which prevents you from attending class on the day of an exam, a suitable make-up exam will be given on a case-by-case basis.

It is your responsibility to find out what was covered in any lecture that you miss.

Course Policies :

- **Low Exam Policy:** If your grade on the final exam is better than the grade on your lowest midterm exam, your final exam grade will replace your lowest midterm exam grade. **Note:** you must take all three midterm exams.

- **Calculator Policy:** You may use a scientific or simple function calculator on exams, but not a graphing calculator.

- **Use of Moodle:** I will use Moodle to post links to lecture notes, homework assignments, solutions to homework assignments and exams, worksheets, and review packets. Please make sure you are able to access the Moodle site and bookmark it.

- **Use of Email:** I will use trincoll email to make announcements. Please make sure that your Trinity email account is working and check regularly for announcements. You will also email me your solutions to homework assignments and exams.

Schedule

Monday	Tuesday	Wednesday	Thursday	Friday
5/18 • 3-dim. space • Vector algebra	**5/19** • Vector algebra • Dot- and cross-products	**5/20** • Dot- and cross-products • Lines and planes in 3-dim. space	**5/21** • Lines and planes in 3-dim. space • Vector-valued functions	**5/22** **No class**
5/25 **No class**	**5/26** • Calculus of vector-valued functions	**5/27** • Calculus of vector-valued functions • Functions of 2 and 3 variables	**5/28** • Functions of 2 and 3 variables • **Exam 1**	**5/29** • Limits and continuity • Partial derivatives
6/1 • Partial derivatives • Directional derivatives and differentiability	**6/2** • Directional derivatives and differentiability • Chain rule and the gradient • **HW 1 due**	**6/3** • Chain rule and the gradient • Extreme values	**6/4** • Extreme values • **Exam 2**	**6/5** **No class**
6/8 • Double integrals over rectangular regions	**6/9** • Double integrals over general regions • . . . in polar coordinates • **HW 2 due**	**6/10** • Double integrals in polar coordinates • Triple integrals over general regions	**6/11** • Triple integrals in cylindrical and spherical coordinates • **Exam 3**	**6/12** **No class**
6/15 • Vector fields. • Line integrals	**6/16** • Line integrals • Green's theorem • **HW 3 due**	**6/17** • Surface integrals and Stokes' theorem • **Review for final exam**	**6/18** • **Final exam**	**6/19** **No class**

The content, policies, assignments, and schedule listed in this syllabus are subject to change. I will announce any changes in class and via email.