

Math 132-01
Calculus II: Integral Calculus
SPRING 2024

Instructor: Prof. M. Sandoval,, MCEC 277, 297-2062, email: msandova@trincoll.edu. (This is the best way to contact me.)

Time and Location: MWF 8:30am–9:45am, Location: McCook 225.

Office Hours (held on Zoom) (See Moodle site for the most up-to-date schedule of office hours):

Monday	1:30pm–3pm
Tuesday	none, except by appointment
Wednesday	1:30pm–3pm
Thursday	none, no appointments
Friday	1:30pm–2:30pm

Or by appointment. Please allow 48 hours to find a mutually agreeable time.

As a supplement to office hours, note that the Aetna Q-Center has tutoring hours for this course. See the moodle site for the link to latest version of the Q-Center tutoring schedule.

About this course: In this course, we continue to study the big ideas from first semester calculus—namely, that Calculus is the mathematical analysis of quantities that change. Now, however our focus will be on starting with a known rate of change (a derivative function) and using it to understand the net change of some unknown function. As we know from Calculus I, change can be analyzed by dividing up an interval over which a quantity is changing, and calculating the average change on each little subinterval, then letting the size of the subintervals go to zero. This is the same as taking the limit of the average rate of change over an interval that is going to zero. We will extend this idea in Calculus II. In particular, this course will focus on the following big ideas:

1. The idea of approximating the net change in a function by adding up the net change over small subintervals;
2. The definite integral as a means of understanding complex quantities;
3. Functions defined by definite integrals;
4. Methods of integrating elementary functions;
5. Expressing functions as infinite summations (infinite series).

By the end of this course, successful students will be able to

1. Increase their problem-solving and critical thinking abilities;
2. Deepen abstract thinking skills;
3. Increase their ability to communicate mathematical concepts;
4. Solve problems involving rates of change to find total or net change;
5. Develop and practice many methods of integrating functions;
6. Use mathematical relationships to integrate functions;
7. Appreciate the usefulness of calculus in solving many practical problems.

In a college-level calculus course, we strive for a deeper conceptual understanding of mathematics than you may have encountered in your previous high school mathematical experiences. It is normal to find yourself asking questions, whether in class or outside of class. If you find that you have questions outside of class, feel free to come see me during my office hours or make an appointment. This course is sufficiently fast-paced that there will not be regular times set aside for homework questions during the class. In office hours, I will help you learn how to develop the skills to do the homework on your own.

You are expected and encouraged to come to office hours whenever you have questions about the material. If you are unable to make use of my office hours at a particular time, please contact me to make an appointment in advance. We can usually find a time that works for both of us.

You may also wish to make use of the tutors in the Q-Center. I will distribute a list of Q-Center hours when such a list becomes available. Please note: you should start the homework soon enough so that you can take advantage of my office hours. If you wait until the last minute to begin the homework, you will not be able to make use of office hours and you will find yourself forced into turning in an incomplete or badly done assignment.

Textbook: *Calculus* by Laura Taalman and Peter Kohn. The most successful students in this course carefully read the assigned portions of the textbook, especially the examples. In fact, it may be necessary for you to read the text and examples in order to complete the assignments, as we may not have time to explore every wrinkle in the material that might come up in the course of a homework assignment.

Book buying options:

For this course, you will need either an physical or electronic copy of the textbook and an access code to the on-line homework website: Achieve. The link for this website is available on the moodle site. You may either purchase access to it through the bookstore for \$49.99 or purchase access to it through the Achieve link for \$39.99.

You can

1. buy a physical copy of the book from the bookstore. It comes packaged already with an access code for the online-website;
2. use the link on the moodle site (or below) to access to an electronic book and purchase access to the online homework website (see below);
3. buy a physical or rent a physical copy of the text from somewhere else and buy access to the online homework website (see below).

The bookstore purchasing options are \$49.99 for standalone Achieve access and \$196.56 for the textbook bundle.

Which option is best probably depends on what your plans are and what kind of deal you can find on a physical copy of the textbook. If you plan to complete all three semesters of calculus, then it might make sense to get a physical copy of the textbook.

Textbook: Textbook

Password: tkch@pt3rs!

Solutions: Odd-numbered Solutions

Password: M@cmillan1

If you prefer a physical copy of the text, then you will need to spend some additional money on a new copy of the text, or a used copy of the text, or rent a text from the bookstore.

Material: Chapters 4, 5, 6 (Section 5 only), 7, and 8, most sections, unless otherwise noted.

Grading: The grade in this course has four components: weekly problem sets and quizzes, three in-class exams, and a final. They will count toward the grade as follows.

Attendance and Participation	5%
Weekly On-line Assignments	5%
Written Problem Sets	15%
Quizzes, Worksheets, or other In-class Work	5%
Three Exams	15% each, 45% total
Final Exam	25%

There is no extra credit in this course. Per departmental policy, the grade of A+ is not available in any 100-level course.

Attendance and Absences: Successful students attend all classes. Attendance is taken in each class. Each day that you are present, you receive one point. The attendance is average is calculated as a percentage of the number of points earned of the total number of points. That average is weighted at 5 percent of the total grade.

If you are absent, it is **your responsibility to do the following:**

- To get any handouts or assignment sheets you have missed.
- To get a copy of the class notes from one of your classmates. I cannot repeat lectures for absent students.
- To learn the material that you have missed. (I am, of course, available in office hours to assist you.)
- To know and keep the **same** deadlines as everyone else.
- To collect any graded papers that may have been handed back on the day that you missed.

Weekly On-line Assignments: These will be assigned online via the WebAssign platform. See above for access information. These are designed to give you practice and immediate feedback with multiple chances to get the problem correct.

Written Problem Sets: These will be assigned weekly and will be more involved with an emphasis on developing your explanatory skills.

Attendance and Classroom Deportment: Attendance **and class participation** are a portion of your grade (see above). If you are working on the assigned tasks in class you will be awarded full credit for attendance and class participation, and will be taken into account in the calculation of the final grade. If a pattern of non-attendance or non-participation becomes apparent, midterm grade reports make note of this pattern. The use of cell phones are not permitted during class for any reason, but laptops and tablets may be used for consulting videos/submitting assignments, and working on class activities, provided that they do not become a distraction to other students. If you have questions in class, please ask them, verbally. In the classroom, there are many things that have my attention, and if you just raise your hand without saying anything, I may not see your hand. It is my expectation that you will verbally get my attention if you should need it.

Quizzes, Worksheets, or other In-class Work: Worksheets or quizzes will be given as in class assignments or take-home assignments, and will assess your understanding of several sections of the material.

Exams: There will be three exams, occurring in class on the following dates:

Friday, February 15th
Wednesday, March 20th
Friday, April 19th

There will be no make-up exams unless I receive notification from the appropriate dean. Make your travel plans accordingly. In the event of a snow day, one or more exams may be moved to the evening, but only if necessary. A missed exam will result in a zero score. None of the exam scores will be dropped. In terms of content, 80 percent of the in-class exams will consist of problems that are similar to problems from the homework or from in-class examples, or are shortened versions of the above, perhaps recast in a different format. The remaining 20 percent of the exam may consist of questions which test the depth of your understanding of the material, but may not resemble the homework or in-class examples.

The Final: The final exam is on Wednesday, May 10th, at noon. Make your travel plans accordingly. For logistical reasons, the final cannot be rescheduled for students who make conflicting travel plans. Consult with your parents immediately so that they do not unknowingly make conflicting travel plans for you. If you cannot come to the final exam at the announced time, you will not receive a grade for the course. If you have a medical excuse or very good reason to miss the final you must petition the Academic Affairs Committee for an INCOMPLETE.

Calculators and Laptops: In general, certain calculators are okay (such as the TI-84 models) and may be used on the homework and in class. However, the rules for calculator use on exams varies from exam to exam, and will be spelled out in advance. Certain types of advanced calculators are banned altogether (for example anything above a standard TI-84 is prohibited) and certain types of calculators are prohibited in certain situations. Cell phones, iPads, or other devices with internet capabilities are prohibited in lieu of calculators. Laptops, cellphones, or other electronic devices may not be used during class, except during group work and only if its use is relevant to the task at hand.

Expectations: For this course, you should expect to spend an average of 11.5 hours per week studying and completing assignments.

Athletes and Scheduling Difficulties: Athletes and others who have scheduled absences are responsible for notifying me in advance of any scheduling conflicts with deadlines, or exams. In addition, if there are sudden changes in your schedule, due to playoffs or rain-outs, you are responsible for notifying me in advance as well.

Absences: As wise old college students, you know that in the event that you are absent, it is your responsibility to do the following:

- To get any handouts or assignment sheets you have missed.
- To get a copy of the class notes from one of your classmates.
- To learn the material that you have missed. (I am, of course, available in office hours to assist you.)
- To know and keep the same deadlines as everyone else.
- To collect any graded work that has been handed back during the missed class.

Academic Honesty: Academic honesty is highly valued at Trinity. 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 students do their own work and that they credit properly those upon whose work and thought they draw. In this course, you may not draw upon internet solutions or the work of others. It is the responsibility of each student to make sure that he or she is fully aware of what constitutes intellectually honest work in every examination, quiz, paper, laboratory report, homework assignment, or other academic exercise submitted for evaluation in a course at Trinity College.

Students with Academic Accommodations: Trinity College is committed to creating an inclusive and accessible learning environment consistent with the Americans with Disabilities Act. If you have approval for academic accommodations, please notify faculty during the first two weeks of the semester or a minimum of 10 days prior to needing your accommodations. Please be sure to meet with me privately to discuss implementation. If you do not have approval for academic accommodations, but have questions about applying for academic accommodations, please contact the Student Accessibility Resource Center, by emailing: SARC@trincoll.edu. The website is <https://www.trincoll.edu/sarc/students/>. Academic accommodations are available ONLY to students who have approval for academic accommodations.

Finally: Unless stated otherwise, all other matters of course policy are subject to the instructor's discretion and may be changed with suitable notice.

Tentative Course Schedule (Subject to change. See the moodle site for updates.)

1	M	Jan 22	Into, 4.1	Addition & Accumulation
1	W	Jan 24	4.1	Addition & Accumulation
1	F	Jan 26	4.2	Riemann Sums
2	M	Jan 29	4.2	Riemann Sums
2	W	Jan 31	4.3	Definite Integrals
2	F	Feb 2	4.4	Indefinite Integrals
3	M	Feb 5	4.5	Fundamental Theorem of Calculus
3	W	Feb 7	4.5	Fundamental Theorem of Calculus
3	F	Feb 9	4.6	Areas and Average Values
4	M	Feb 12	4.7	Functions defined by Integrals
4	W	Feb 14	5.1	Integration by Substitution
4	F	Feb 16	Exam 1	Chapter 4
5	M	Feb 19	5.1, 5.2	Integration by Substitution and by Parts
5	W	Feb 21	5.2	Integration by Parts
	F	Feb 23		Trinity Days-no class
5	M	Feb 26	5.3	Integration by Partial Fractions
	W	Feb 28		Bicentennial Day-no class
6	F	Mar 1	6.5	Separable Differentiable Equations
6	M	Mar 4	5.5	Trigonometric Integrals
6	W	Mar 6	5.5	Integration by Trigonometric Substitution
7	F	Mar 8	5.6	Improper Integrals

	M	Mar 11		spring break - no class
	W	Mar 13		spring break - no class
	F	Mar 15		spring break - no class
7	M	Mar 18	5.1-5.6	Integration Wrap Up
7	W	Mar 20	Exam 2	Chapter 5, 6.5
8	F	Mar 22	7.1	Sequences
8	M	Mar 25	7.2	Limits of Sequences
8	W	Mar 27	7.3	Series, Divergence Test
9	F	Mar 29	7.4	Integral Test
9	M	Apr 1	7.5	Comparison Tests
9	W	Apr 3	7.5	Comparison Tests
10	F	Apr 5	7.6	Alternating Series
10	M	Apr 8	Ch. 7	Series Wrap-up
10	W	Apr 10	8.1	Power Series
11	F	Apr 12	8.1	Power Series
11	M	Apr 15	8.2	Maclaurin Series
11	W	Apr 17	8.2	Taylor Series
12	F	Apr 19	Exam 3	Chapter 7, 8.1
12	M	Apr 22	8.3	Convergence of Power Series
12	W	Apr 24	8.3	Convergence of Power Series
13	F	Apr 26	8.4	Differentiating and Integrating Power Series
13	M	Apr 29	8.4	Differentiating and Integrating Power Series
13	W	May 1		Review
	F	May 10		Final Exam noon-2:30pm