

Math 127 Functions, Graphs, and Modeling
Course Policies
Spring 2024

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

Time and Location: MWF 11 - 11:50pm, location: McCook 213.

Couse Website: We have a Moodle Website in the usual place.

Office Hours (held in MCEC 277) (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

About this course: Being able to understand how quantities change is an essential skill in understanding the world around us. We use mathematics to understand change via a process called “modeling”—that is we use mathematical formulas to construct a model to describe the changing quantities that we observe in the world around us. In order to do this, we need to become acquainted with various common types of **functions** that describe many of the changing quantities that we see in the phenomena around us. One way of studying functions is to visualize them through their graphs. This is a rich subject, with many useful and interesting applications. Indeed, modern life would be impossible without the technical understanding that mathematical models bring. In this course, we consider the following big ideas:

1. The concept of a function and various types of functions using a variety of mathematical processes;
2. The concept of the graph of a function and the various characteristics and properties of graphs;
3. The idea of modeling a changing quantity with an appropriate function from our library of common functions.

Throughout our studies we will focus on how these ideas can be used to solve real world problems through “mathematical modeling” of various phenomena that we observe in the real world.

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

1. Increase their problem-solving and critical thinking abilities;
2. Increase their ability to communicate mathematical concepts;
3. Solve real world problems by modeling changing quantities with functions;
4. Be able to visualize change via a function’s graph;
5. Be able to choose a suitable function to model given data.

Office Hours: 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. Sometimes the strategies and methods of studying that worked in lower level courses or in high school are no longer sufficient for more difficult coursework. It is normal to find yourself wrestling with the material in some way. If you find that you have questions or find that you need some new strategies or approaches to be successful in this 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. It is quite normal for students to regularly make use of my office hours. In office hours, I will help you learn how to do the homework on your own. I will not do any of the assigned homework problems *for* you. I will gladly review similar problems as examples for you to follow, or review general techniques and strategies. I can also suggest strategies or approaches to the material that you may not be employing. It is your responsibility to see me if you are having difficulty with the homework in a timely manner. Being able to effectively manage your time is one of the most useful strategies you can employ to improve your learning in any course!

You may also wish to make use of the tutors in the Math Center. The most up-to-date schedule is available via the link on the moodle site. 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. I will post a schedule for the Q-Center as soon as one becomes available.

Textbook: *Precalculus* by D. G. Zill and Jacqueline M. Dewar. This text is available both on-line and in print—take your pick! You will be expected to read the assigned sections of the text and work through the examples. In fact, it will often be necessary for you to read the text and examples to do the homework, as we will not have time to explore every wrinkle in the material that might come up in the course of a homework assignment. Reading will be checked via in-class assignments.

Material: Chapters 1 through 6, most sections.

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.

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. buy access to an electronic book and 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).

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.

To gain access to the on-line homework website and an electronic copy of the textbook log on to www.webassign.net, and use the class code **trincoll 6145 8611**. The cost of the accessing the website depends on the type of access you wish to purchase which depends on your future plans. All access plans include access to the online assignments.

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.

Grading: The grade in this course has five components: frequent online homework sets, weekly written homework sets, three in-class exams, and a final. They will count toward the grade as follows.

Attendance, Class Activities, and Group Work	5%
On-line homework	10%
Written work	10%
Quizzes	10%
In-class Exams	45%
Final Exam	20%

The letter grade in this course is based on a straight scale, with the exceptions (1) that I do not decorate D grades with plusses or minuses; and (2) the grade of A+ is not available in 100-level courses, per department policy.

Extra credit beyond the above is not available. Late assignments will not be accepted except under extraordinary circumstances that can be documented via the Dean of Students Office.

Attendance and Classroom Deportment: Attendance will be taken and will be taken into account in the calculation of the final grade. If a pattern of non-attendance becomes apparent, midterm grade reports make note of this pattern. The use of cell phones and laptops are not permitted during class for any reason. Tablets may be used for note-taking purposes provided that they do not become a distraction to other students.

Absences: 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. Due to time constraints it is not possible for your professors to repeat, summarize, or recap lectures for absent students. You should obtain and study these notes promptly to stay on top of the material.
- To learn the material that you have missed. (I am, of course, available in office hours to assist you, but you will need come prepared, having studied the notes from the classes you have missed. You should come with detailed questions, and be prepared answer questions on what you do know, so that I can help you as efficiently as possible.)
- To know and keep the **same** deadlines as everyone else.
- To collect any graded papers that may have been handed back on the days that you missed class.

Written homework assignments: I will also regularly assign problems from the book to be written out and turned in for a grade. This homework is designed to give you feedback about your process, as opposed to just determining whether the answer is right or wrong. On exams, you will be graded on the entire process of answering a question, not just whether or not the answer is right or wrong, so the feedback on these assignments will be particularly valuable in helping your prepare for the exams. Late homework will not be accepted.

Exams: There will be one long quiz, and three exams, tentatively scheduled for the following dates:

Friday, February 2nd
Monday, February 12th
Wednesday, March 27th
Wednesday, April 19th

For exams, we will observe the following rules. Other additions will be made as necessary.

1. No communications devices such as cell phones, ipads, etc. are permitted in the exam. These devices must be turned off. In particular, you may not use the calculator function on any device that can communicate wirelessly or access the internet.
2. No sharing of calculators or other devices.
3. No scrap paper. Scrap paper will be provided to you if you require it.
4. No kleenex. Kleenex will be provided to you if you require it.
5. All books and papers must be stowed in backpacks, bags, et cetera.
6. If you leave the exam room without permission, even if it is for a bathroom break, your exam will be collected graded as is.

There will be no make-up exams. If you suffer from a sudden illness or emergency that prevents you from taking an exam, then you must notify me and the Dean of Students Office by email, telephone message, or other means of communication prior to or during that exam. If your emergency is deemed sufficient to excuse you from the exam, you will not be given a make-up exam—your final exam will simply be lengthened and rescaled to make up for the lost points. A missed exam that has not been excused by the instructor and the Dean will result in a zero score. None of the exam scores will be dropped.

The Final: The final exam is scheduled for Wednesday, May 8th, at noon in our regular classroom. Make your travel plans accordingly. For obvious logistical reasons, the final cannot be rescheduled for students who make conflicting travel plans. If you cannot take the exam at the usual time, you must apply to the Academic Affairs Committee to determine if you can take the exam at another time, probably at the start of the following semester. Successful applications to have the final exam moved require medical or other documentation of the reason for not being able to take the exam at the scheduled time. In the interim, the student receives a NO GRADE which reverts to an F until the exam is made up.

Expectations: For this course, you should expect to spend an average of 9 hours per week studying and completing assignments. This work may take the form of finishing in-class activities, working on assignments, actively reading the text, and preparing for the exams.

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.

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.

List of Topics:

- The Real Numbers
 - Inequalities and Equations
 - The Cartesian Coordinate System
 - Graphs of geometric shapes
 - Graphs of functions
 - Symmetry and Transformations
 - Linear Functions
 - Quadratic Functions
 - Piecewise Functions
 - Combining functions to create new ones
 - Functions defined by equalities
 - Inverse Functions
 - Functions defined by words
 - Polynomials
 - Rational Functions
 - Trigonometric Functions
 - Exponential Functions
 - Logarithmic Functions
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Tentative Course Schedule (Subject to change. See the moodle site for updates.)

1	M	Jan 22	1.1	Syllabus, The Real Line
1	W	Jan 24	1.2	Absolute Value
1	F	Jan 26	1.3	The Rectangular Coordinate System
2	M	Jan 29	1.4	Circles and Graphs, Desmos
2	W	Jan 31	2.1	Functions and Graphs, Desmos
2	F	Feb 2		First Quiz
3	M	Feb 5	2.2	Symmetry and Transformations
3	W	Feb 7	2.3	Linear Functions
3	F	Feb 9		Review
4	M	Feb 12		Exam 1: Chapters 1 and 2.1-2.3
4	W	Feb 14	2.4	Quadratic Functions
4	F	Feb 16	2.4	Quadratic Functions
5	M	Feb 19	2.5	Piecewise Functions
5	W	Feb 21	2.6	Combining Functions
	F	Feb 23		Trinity Days-no class
5	M	Feb 26	2.6	Combining Functions
	W	Feb 28		Bicentennial Day-no class
6	F	Mar 1	2.8	Inverse Functions
6	M	Mar 4	2.8	Inverse Functions
6	W	Mar 6	3.1	Polynomial Functions
7	F	Mar 8	3.1	Polynomial Functions

	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	3.2	Division of Polynomial Functions
7	W	Mar 20	3.3	Zeros and Factors of Polynomials
8	F	Mar 22	3.4	Real Zeros of Polynomial Functions
8	M	Mar 25		Review
8	W	Mar 27		Exam 2 2.4--2.6, 2.8--2.9, Chapter 3
9	F	Mar 29	3.5	Rational Functions
9	M	Apr 1	4.1	Angles and Their Measurement
9	W	Apr 3	4.2	The Sine and Cosine Functions
10	F	Apr 5	4.3	Graphs of Sine and Cosine
10	M	Apr 8	4.4	Other Trigonometric Functions
10	W	Apr 10	4.5	Sum and Difference Formulas
11	F	Apr 12	4.7	Inverse Trigonometric Functions
11	M	Apr 15	4.8	Trigonometric Equations
11	W	Apr 17		Review
12	F	Apr 19		Exam 3 4.1--4.7
12	M	Apr 22	4.10	Right Angle Trigonometry
12	W	Apr 24	5.1	Exponential Functions
13	F	Apr 26	5.2	Logarithmic Functions
13	W	May 1		Review
	F	May 8		Final Exam noon-2:30pm