

Course Syllabus

MATH 1100: Calculus Techniques

Information about Instructor:

Instructor: Pata Rujirawat Email: pata.rujirawat@usu.edu

Office: ANSC 309 Phone: 435-797-0745

Office Hours: **Tuesday** 2:30PM-4:30PM using the Zoom link below:

<https://usu-edu.zoom.us/j/87960002725?pwd=ZTBETUtUR0V6Z0RVeDZ1dUZGYzRBQT09&from=addon> 
[_](https://usu-edu.zoom.us/j/87960002725?pwd=ZTBETUtUR0V6Z0RVeDZ1dUZGYzRBQT09&from=addon)

Office Hours: **Thursday** 2:30PM-3:30PM using the Zoom link below:

<https://usu-edu.zoom.us/j/82482694702?pwd=TXcvWnBUMHlodU1CYU1qWXcrVFRuUT09&from=addon> 
[_](https://usu-edu.zoom.us/j/82482694702?pwd=TXcvWnBUMHlodU1CYU1qWXcrVFRuUT09&from=addon)

Message from your instructor


Welcome to Calculus! I'm Pata Rujirawat, a lecturer in Mathematics & Statistics Department, I am grateful that you are signed up for the course and I am looking forward to our working together in the world of applied calculus.

As the instructor, I have no agenda other than doing whatever I can to make this course interesting and relevant, and to assist you with your questions and concerns. Hopefully, this will lead to an experience that is both meaningful and positive, and ultimately, successful.

Before reading any further, here are some first things to know:

1. **My highest priority this semester is your success in this course.** I am committed to helping you be successful in MATH 1100 this semester. "Success" means more than just good grades. It means that you are being **challenged** to grow as a learner, that you are **engaging actively** with tasks that feed your growth, and that you are creating **excellent work** in mathematics by completing challenging Calculus-related tasks with a appropriate level of support. It also means that you are **building your lifelong learning skills** so that once the course is over, you are better and stronger as a learner and can continue to **learn new things independently**, and especially go on to **success in courses that have MATH 1100 as a prerequisite**.
2. **College level mathematics is more than just computation.** On the pathway to "success" as outlined above, you will be asked to do more than just perform computations. You will be working on **explaining the meaning** of mathematical processes and results in oral and written forms to different audiences; **working on realistic applications** of basic skills to authentic problems; **extending basic ideas** to more advanced concepts; and **seeking true understanding** of underlying concepts. In fact, many of the computations you might do with algebra in high school level mathematics will be automated through computers in MATH 1100, and your work will mostly focus on these higher-level tasks.
3. **You can expect to be challenged intellectually throughout this course.** None of these elements of "success" come easily. They require dedicated devotion of time and energy to wrestling with the concepts and tasks in the course. This will require you to leave your comfort zones on a regular basis. You may find that you need to rewire your entire process for learning things. You will need to stay constantly engaged with the course through

participation in class meetings and on the class discussion board --- asking questions, seeking understanding, and giving help.

4. **Intellectual struggle is normal and healthy in a challenging course.** Since none of this is easy, you can expect at times to feel like you are really struggling with the material --- even if in your earlier math courses you might never have experienced struggle. **This is normal and healthy.** Legitimate struggle is actually a sign you are doing things right, and it's a signal you're about to experience explosive growth. When you are building physical muscles, the point at which you are growing the most is the moment you experience the greatest strain and fatigue. **Our class is a safe place for you to experience those struggles.**
5. **You have a lot of help available to you as you work.** Throughout the semester, you will be challenged but also given a lot of support to help you rise to the challenge. I will be readily available to help in several channels; your classmates will be available for help through structured and informal support groups; and USU Mathematics & Statistics Department provides free help through the [Aggie Math Learning Center \(AMLC\)](https://math.usu.edu/amlc/mathstatstutoring)  (<https://math.usu.edu/amlc/mathstatstutoring>). **Everyone in the course has your back.**
6. **You will find MATH 1100 to be very enjoyable if you embrace the challenge.** Although hard work doesn't always feel good in the moment, by embracing the challenge and committing to learning Calculus, I think you will find that **growth is fun** and **Calculus is really interesting stuff.**

What's MATH 1100 all about?



This course is NOT designed for students who plan to go into science, engineering, or mathematics. Unlike Calculus I, II and III, we will not be using trigonometry at all in this course. The scientists and engineers learn how to apply calculus to physics problems, such as work. They do a lot of geometric applications, like finding minimum distances, volumes of revolution, or arclengths. In this class, we will do only a few of these (distance/velocity problems, areas between curves). On the other hand, we will learn to apply calculus in some economic and business settings, like maximizing profit or minimizing average cost, finding elasticity of demand, or finding the present value of a continuous income stream. Additionally we will apply calculus in life and social science settings, like determining the rate at which drug concentration in the body is changing, or exploring the rate at which a subject learns. These are applications that are seldom seen in a course for engineers.

MATH 1100 goes beyond just computation. In this course, you'll build skills with **understanding** complex concepts, **communicating** those concepts and the meaning of your results to appropriate audiences, **using professional tools** to help you in your work, and practice **working with others** to improve your learning (and theirs). These are valuable skills no matter where you go next.

Success in this course doesn't come easy, and you can expect to be pushed and stretched intellectually. But the struggle you experience is normal and healthy, a sign of growth and that you are doing things the right way. And you will receive tireless support from me, my teaching assistant and your classmates in the process. Above all, **my top priority is to support you in your work and help you succeed.**

Prerequisites





Each **student** is responsible for both knowing and satisfying the prerequisites for this course. If a student does not possess the necessary prerequisites, he or she will be dropped from the course by computer check and the notification of such a drop generally occurs after the date when any refund is possible and most likely after the ADD deadline.

 Please make sure you are qualified to be enrolled in this course. For the current prerequisite for this course, please consult USU General Catalog from <https://catalog.usu.edu/>  (<https://catalog.usu.edu/>).






Course Objectives

1. Use rates of change and the tools of differential calculus to analyze functions and solve applied problems. This includes estimating and computing derivatives, interpreting derivatives in context, and solving problems with specific applications related to business or economics (such as marginal cost and elasticity).
2. Use accumulated change and the tools of integral calculus to analyze functions and solve applied problems. This includes estimating and computing definite integrals, interpreting integrals in context, and solving problems with specific applications related to business or economics (such as consumer surplus).
3. Apply the tools of calculus to analyze functions of two variables and solve applied problems. This includes estimating and computing partial derivatives, interpreting partial derivatives in context, optimizing functions of two variables, and solving problems with specific applications related to business or economics (such as production functions).

Key Information

- **Course mode:** This section of MATH 1100 is **face-to-face**, which means we will meet in a classroom at regularly scheduled times.
- **Class meetings:** MWF 12:30am-1:20pm in ENGR 101
- **Instructor contact:** Email at pata.rujirawat@usu.edu (<mailto:pata.rujirawat@usu.edu>), or direct-message me on Canvas. You may also call my office at 435-797-0745. If you have a question that the entire class might answer, please post it to the Class Feed in the 'General' channel on Microsoft Teams instead of in a private message.
- **Instructor availability:** I check messages 3-4 times between 9:00am and 3:00pm on weekdays, and once on Saturdays. If you contact me during those hours and your message needs a reply, you can expect to receive one within a 24 hours, often sooner. *Outside of those hours, particularly on weekends, I am typically offline and not checking messages.* Please plan accordingly as you schedule your work.
- **Office hours:** TR 9AM-10:30AM using the Zoom link: <https://usu-edu.zoom.us/j/86188377180?pwd=ZTM5bmRXVjBESDhyRzUzUVBSNXkxQT09&from=addon>  ([http://TR%209AM-10:30AM%20using%20the%20Zoom%20link%20below:}%20url{https://usu-edu.zoom.us/j/86188377180?pwd=ZTM5bmRXVjBESDhyRzUzUVBSNXkxQT09&from=addon}\)](http://TR%209AM-10:30AM%20using%20the%20Zoom%20link%20below:}%20url{https://usu-edu.zoom.us/j/86188377180?pwd=ZTM5bmRXVjBESDhyRzUzUVBSNXkxQT09&from=addon}))
- **Getting Help and Support**
 - **Aggie Math Learning Center (AMLC) :** You may find the detailed instructions on how to use the online tutoring service or the face-to-face tutoring service, and their up-to-date schedule from <https://math.usu.edu/amlc/mathstatstutoring>  (<https://math.usu.edu/amlc/mathstatstutoring>)
- **Course announcements and communication:** Course announcements, discussion, and other communication will be housed in Canvas [Announcements](https://usu.instructure.com/courses/676260/announcements) (<https://usu.instructure.com/courses/676260/announcements>)
- **Textbooks and Suggested Reading:** No textbook is required to purchase for this class. Class lessons are written by the instructor. The content of the FREE textbooks below are remixed into most lessons. You may further read the textbooks besides the class lessons. All textbooks below are licensed under: [CC-BY-4.0](https://creativecommons.org/licenses/by/4.0/)  (<https://creativecommons.org/licenses/by/4.0/>)
 - Shana Calaway, Dale Hoffman, David Lippman, *Applied Calculus*. For a free copy of this text, visit <http://www.opentextbookstore.com/details.php?id=14> 

(<http://www.opentextbookstore.com/details.php?id=14>) . Click the "Read Now" link to download the pdf version for FREE. If you want a printed copy, click the "Order" link to buy a copy.

- Dale Hoffman, *Contemporary Calculus I*. Disregard any examples with trigonometry in this textbook. For a free copy of this text, visit <https://www.opentextbookstore.com/details.php?id=11#tabs-3>  (<https://www.opentextbookstore.com/details.php?id=11#tabs-3>) . Click the "Read Now" link to download the pdf version for FREE. If you want a printed copy, click the "Order" link to buy a copy.
- Gilbert Strang, Edwin “Jed” Herman et al., *Calculus Volume 1*. Disregard any examples with trigonometry in this textbook. For a free copy of this text, visit <https://openstax.org/details/books/calculus-volume-1>  (<https://openstax.org/details/books/calculus-volume-1>) . Click the "Read Now" link to download the pdf version for FREE. If you want a printed copy, click the "Order" link to buy a copy.
- *Active Calculus* by Matt Boelkins (August 2020 version). This is available *free* online here: <https://activecalculus.org/single/frontmatter.html>  (<https://activecalculus.org/single/frontmatter.html>) You can also download a PDF copy here: <https://scholarworks.gvsu.edu/books/18/>  (<https://scholarworks.gvsu.edu/books/18/>) You do not need a print copy, but if you want one, you can order it here: <http://amzn.to/38HQdlo>  (<http://amzn.to/38HQdlo>) (Note this is the 2018 version.)

- **Course materials:** Most course files, the class calendar, class forms, and most graded assignments are housed on Canvas.
- **Calculator:** see [Calculator Policy](https://usu.instructure.com/courses/676260/pages/calculator-policy) (<https://usu.instructure.com/courses/676260/pages/calculator-policy>)

What will class meetings be like?

Your work in the class will follow a pattern that will involve you **before**, **during**, and **after** our meetings:

- **BEFORE each class:** You'll complete a **Class Prep** assignment in which you'll read parts of the text, watch videos, and complete assignments that will get you up to speed on the basic ideas of new material.
- **DURING each class:** Class time is reserved for *doing math*, together and individually. We will focus on activities that **apply the basics** that you learn in Daily Prep and get you ready for more advanced work later.
- **AFTER each class:** You'll apply and extend the ideas we practice during class through different kinds of assignments.

Since you learn math by *doing* math, class time will be prioritized for **doing active work on applications of basic concepts**. You'll be expected to gain enough fluency on those basics to be productive in class, by doing your Daily Prep assignments. Lectures during class will be infrequent, short, and targeted at specific questions from your work rather than a general introduction to concepts.

Learning Targets/Outcomes

There are [16 Learning Targets](https://usu.instructure.com/courses/564600/pages/learning-targets-slash-outcomes-for-exams) (<https://usu.instructure.com/courses/564600/pages/learning-targets-slash-outcomes-for-exams>) in the course. These are the main tasks that you should be able to do if you are successful in MATH 1100. Ones that are designated as **Core** learning targets because they are the most essential topics in the class. *Your main goal in the course is to provide evidence of skill on as many targets as possible* through the assignments listed below this syllabus.



What assignments will there be?

A tentative due dates for the assignments listed below are available on Canvas under [Course Summary](#) on the [Syllabus](#) (<https://usu.instructure.com/courses/676260/assignments/syllabus>) page.

- **Exams:** There will be **THREE** mid-term exams in this class. There are 10 learning targets aligned with each exam. Each exam must be taken with our USU Academic Testing Services (<https://www.usu.edu/testing/>) which provides a secure proctoring environment. These exams allow you *opportunities* to demonstrate your mastery level on specified learning outcomes. You will have ***opportunities to re-take the assessments*** after your reflection and revision being submitted.
- **Final Exam (Summary Assessment):** The final exam for will be comprehensive and focusing on big-picture questions. The exam will be written to assess students on all **CORE** learning outcomes. The final exam ***may not be revised or resubmitted***. The final exam has been scheduled by USU on **Tuesday, May 3rd 11:30am-1:20pm** (<https://catalog.usu.edu/content.php?catoid=12&navoid=25211>) (<https://catalog.usu.edu/content.php?catoid=12&navoid=25211>).
- **Homework Assignments include online assignments (MyOpenMath) and/or traditional assignments.**
 - **MyOpenMath (MOM):** **MOM** is a third-party open-source (free) service providing online homework assignments with instant feedback to help build your computational skills. The assignments are integrated seamlessly on Canvas. MOM problems can be redone and resubmitted as many times as you need until the deadline. However they cannot be redone once the deadline has passed.
- **Class Prep:** Before-class reading and videos, with exercises and questions to be submitted prior to class. These will help you learn the basics of new material and prepare you for more application-focused work in class. In fact one purpose of Class Preps is to provide me with information about issues that the class is having, prior to class meetings. Class Prep assignments *may not* be revised or resubmitted. There will be no makeup Class Prep.
- **Practice and Engagement (PE):** It's very important to practice with the basic material and stay involved in the course. To help you do this, you'll earn "PE credits" (not to be confused with gym class) by completing many different small activities **both during class time and outside class time** through the semester. Any PE activities *may not* be revised or resubmitted. There will be no makeup PE.

Note

- **For all exams**, your work must represent *your own understanding in your own words* and you may not use solutions, directly or indirectly, from other students or unapproved resources.
- On **all other assignments**, you may collaborate with others, but you must contribute significantly to the assignment, and your work must represent *your own understanding in your own words*.
- I do not typically look over student work before it is submitted*. Requests to review student work prior to submission will usually be declined. Instead, when you are submitting work, make sure to double-check your work prior to submitting it, to make sure that all required components are present and that, to your understanding, your work meets the criteria for acceptable quality. If you submit your work and it needs revision, you can revise it.

How are individual assignments graded?

Your grade in the course is earned by **demonstrating evidence of skill on the main concepts in the course** and **showing appropriate engagement with the course**. And this is done by completing the assignments outlined above, at a reasonably high level of quality.

In our class, **there are no points or percentages** on most items. Instead, the work you turn in will be evaluated against **quality standards** that will be made clear on each assignment. If your work meets the standard, then you will receive full credit for it. Otherwise, you will get helpful feedback and, on most items, the chance to reflect on the feedback, revise your work, and then resubmit it for regrading.

This feedback loop represents and supports the way that people learn: By trying things, making mistakes, reflecting on those mistakes, and then trying again. **You can make mistakes without penalty** as long as you *eventually* demonstrate evidence of skill.

The individual types of assignments are marked as follows:

Assignment	How it's marked (Ratings)
Exams	ME (Meet Expectations), AE (Approaching expectations), Q (Questionable) NE (Not Yet Approaching Expectations) or Not Assessable (NA). Click HERE (https://usu.instructure.com/courses/682202/pages/rating-on-rubrics) to see details on ratings.
MyOpenMath	Correct or Incorrect. Mostly, each problem is worth 1 point
Class Prep	Pass or No Pass
Practice and Engagement	Pass or No Pass

For more details on each rating, visit <https://usu.instructure.com/courses/676260/pages/ratings-on-rubric> (<https://usu.instructure.com/courses/676260/pages/ratings-on-rubric>).

How do I earn a letter grade in the course?

Your final grade in the course is determined by the following table. Each grade has a *requirement* specified in its row in the table. **To earn a grade, you will need to meet ALL the requirements in the row for that grade.** Put differently, your grade is the **highest** grade level for which **ALL** the requirements in a row of the table have been met or exceeded.

Learning Targets on Each Exam with Mastery						
Grade	Each Midterm Exam	Final Exam		MyOpenMath	Class Prep Passed	Practice & Engagement Passed
	(out of 10)	Part 1	Part 2			
		Out of 10	Out of 5			
		(see note 1 below)				
A	9	8	5	At least 93%	At least 93%	At least 93%
A-	9	8	5	At least 88%	88%-92%	88%-92%
B+	8	7	4	At least 86%	At least 86%	At least 86%
B	8	7	4	At least 83%	At least 83%	At least 83%

Learning Targets on Each Exam with Mastery

Grade	Each Midterm Exam	Final Exam			MyOpenMath	Class Prep Passed	Practice & Engagement Passed
	(out of 10)	Part 1 Out of 10	Part 2 Out of 5				
	(see note 1 below)						
B-	8	7	4	At least 80%	At least 80%	At least 80%	
C +	7	6	3	At least 76%	At least 76%	At least 76%	
C	7	6	3	At least 72%	At least 72%	At least 72%	
C -	7	6	3	At least 70%	At least 70%	At least 70%	
D	5	5	3	At least 60%	At least 60%	At least 60%	
F	Less than 5	Less than 5	Less than 3	Below 60%	Below 60%	Below 60%	

NOTES:

1. The number of learning outcomes (targets) that students are required to 'Meet Expectations' (see [Rating on Rubrics \(https://usu.instructure.com/courses/682202/pages/rating-on-rubrics\)](https://usu.instructure.com/courses/682202/pages/rating-on-rubrics) for more details). For more details on learning targets, see [Learning Targets: Final Exam \(Part 1\) \(https://usu.instructure.com/courses/682202/pages/learning-targets-final-exam-part-1\)](https://usu.instructure.com/courses/682202/pages/learning-targets-final-exam-part-1) and [Learning Targets: Final Exam \(Part 2\) \(https://usu.instructure.com/courses/682202/pages/learning-targets-final-exam-part-2\)](https://usu.instructure.com/courses/682202/pages/learning-targets-final-exam-part-2)
2. The above scale will be used as a starting point for determining the final course grades. As the course is progressing, I will look at overall students' performance, and if it is necessary, I will make slight adjustments in this scale mainly based on overall learning evidence on learning outcomes. As such, the final grading scale may deviate in some cases from the one provided above.

Exceptions to the Course Rules

If you have any schedule conflict (e.g. unable to complete any assignment by its due date, unable to take an assessment during a scheduled time etc.) due to "extenuating" circumstances as described below, you are required to contact the instructor explaining your circumstances in order to receive any necessary accommodation and/or to avoid your course grade to be lowered due these circumstances. Official written documentation supported your circumstances may be requested by the instructor. Any schedule conflict must be resolved PRIOR a due date of an assignment or a scheduled time for an assessment. The term "extenuating" circumstances that will be accommodated are limited to the following circumstances:

- military duty
- university-sponsored events
- jury duty

- serious illness or medical condition treated by a physician
- death in the immediate family, childbirth
- a change in financial responsibilities requiring a student to alter course schedule to secure employment.

Academic Integrity – "The Honor System"

Each student has the right and duty to pursue his or her academic experience free of dishonesty. To enhance the learning environment at Utah State University and to develop student academic integrity, each student agrees to the following Honor Pledge:

"I pledge, on my honor, to conduct myself with the foremost level of academic integrity."


A student who lives by the Honor Pledge is a student who does more than not cheat, falsify, or plagiarize. A student who lives by the Honor Pledge:

- Espouses academic integrity as an underlying and essential principle of the Utah State University community;
- Understands that each act of academic dishonesty devalues every degree that is awarded by this institution; and
- Is a welcomed and valued member of Utah State University.

Academic Dishonesty

The instructor of this course will take appropriate actions in response to Academic Dishonesty, as defined the University's Student Code. Acts of academic dishonesty include but are not limited to:

- **Cheating:** using, attempting to use, or providing others with any unauthorized assistance in taking quizzes, tests, examinations, or in any other academic exercise or activity. Unauthorized assistance includes:
 - Working in a group when the instructor has designated that the quiz, test, examination, or any other academic exercise or activity be done "individually;"
 - Depending on the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments;
 - Substituting for another student, or permitting another student to substitute for oneself, in taking an examination or preparing academic work;
 - Acquiring tests or other academic material belonging to a faculty member, staff member, or another student without express permission;
 - Continuing to write after time has been called on a quiz, test, examination, or any other academic exercise or activity;
 - Submitting substantially the same work for credit in more than one class, except with prior approval of the instructor; or engaging in any form of research fraud.
- **Falsification:** altering or fabricating any information or citation in an academic exercise or activity.
- **Plagiarism:** representing, by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes using materials prepared by another person or by an agency engaged in the sale of term papers or other academic materials.

For additional information go to: [ARTICLE VI. University Regulations Regarding Academic Integrity](https://studentconduct.usu.edu/studentcode/article6) 
(<https://studentconduct.usu.edu/studentcode/article6>)

What else do I need to know? (Additional course policies)

Please visit <https://usu.instructure.com/courses/676260/pages/additional-course-policy>
(<https://usu.instructure.com/courses/676260/pages/additional-course-policy>) to read additional course policy.