MATH 2413 – Calculus I

Spring 2023

Instructor: Dr. Scott M. LaLonde

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Office hours: Tuesdays & Thursdays, 1:00–2:30 P.M., or by appointment.

Scheduled lectures:

Section 003	**Section 004**
MWF, 10:30 A.M. – 11:45 A.M.	MWF, 1:25 P.M. – 2:40 P.M.
Location: RBN 4025	Location: RBN 4025

Course Information

Course Webpage: All course information and documents will be available on Canvas.

Textbook: There are two recommended textbooks for this course. The content is very similar, so you are free to choose either one to use as your textbook.

- *Essential Calculus: Early Transcendentals (2nd Edition)* by James Stewart.

  This book is available for purchase at the UT Tyler bookstore, from other retailers (in a variety of formats), or as part of a Cengage Unlimited subscription.

- *Calculus, Volume I* by OpenStax.

  This book is freely available online at

  https://openstax.org/details/books/calculus-volume-1

  as an interactive web-based book or a downloadable PDF. Physical copies are also available for purchase.

Prerequisites: In order to take this course, you must satisfy one of the following criteria:

- Grade of C or better in a college trigonometry class. (MATH 1316 or equivalent)
- Grade of C or better in a college precalculus class. (MATH 2312 or equivalent)
- Score of 710 or higher on the SAT (quantitative section).
- Score of 27 or higher on the ACT (math section).
- Satisfactory score on the calculus placement test given by the UT Tyler Testing Center.

Course Description

A study of functions, limits, continuity, differentiation, applications of the derivative, the definite and indefinite integral, and applications of integration.

Student Learning Outcomes

Upon completion of this course, students should be able to do the following:

- Discuss the solution to the tangent and area problems involving limits, derivatives, and integrals. (Communication, Critical Thinking)

- Use graphs of algebraic and transcendental functions to determine limits, continuity, and differentiability at a point. (Critical Thinking)

- Determine whether a function is continuous and/or differentiable at a point using limits. (Analytic, Critical Thinking)

- Apply differentiation rules to differentiate algebraic and transcendental functions. (Analytic, Critical Thinking)

- Choose appropriate calculus concepts and techniques to provide mathematical models of real-world situations and determine solutions to applied problems. (Analytic, Critical Thinking)

- Compute definite integrals using the Fundamental Theorem of Calculus. (Critical Thinking)

- Recognize and discuss the relationship between derivatives and integrals using the Fundamental Theorem of Calculus. (Analytic, Critical Thinking, Communication)

Assignments and Grading

Online Homework

Homework will be assigned daily via Knewton Alta. This platform is integrated with Canvas, so you will be able to access all of the assignments from the course Canvas page. You will also be able to use Knewton Alta for free—you **do not** need to purchase any kind of access code in order to do the online homework.

In general, there will be one assignment for each class period, but assignments will open and close on a weekly basis. Each Friday, the assignments for the next three class days (i.e. Friday, Monday, and Wednesday) will open, and all three will be due by 10:30 A.M. on the following Friday. At the end of Friday's class, you will take a quiz on the material covered in that week's assignments.

Each homework assignment will remain available after its due date, and you can still complete it for 50% credit anytime before the end of the semester. It is still in your best interest to complete assignments by the due date, both to earn full credit and to make sure you are keeping up with the course material.

Quizzes

There will be weekly quizzes given at the end of class on Fridays (except on exam days). Quizzes will be cumulative (i.e. they may cover any material we have done up to that point in the semester), but the focus will be on the material covered on the homework assignments that are due that day.

Each quiz should take approximately 15–20 minutes to complete. I will give partial credit when appropriate on most problems, but you must show all of your work and demonstrate understanding of the material in order to earn full credit on each problem. **No books, notes, or calculators are allowed on quizzes.**

To allow for possible absences due to unforeseen circumstances, you may miss at most two quizzes with no penalty. If you take all of the quizzes, then I will drop your two lowest scores (or

the lowest one in the event that you miss one quiz). The average of the remaining quizzes will be used to compute your final grade.

Exams

There will be four exams given during the semester, with each covering approximately 3–4 weeks of material. The tentative dates for the exams are:

- **Exam 1:** February 3
- **Exam 2:** February 24
- **Exam 3:** March 24
- **Exam 4:** April 14

All exams will be held during our usual class time. As with the weekly quizzes, you must show all of your work in order to receive full credit, and **no books, notes, or calculators are allowed.**

When computing your overall grade, the exam scores will be weighted based on your performance. Your lowest exam will count for 10% of your overall grade, while the other three will each make up 15% of your grade.

Final Exam

In addition to the four regular exams, you will take a comprehensive final exam at the conclusion of the semester. The tentative date for this exam is:

- **Section 003:** Monday, April 24, 10:15 A.M. – 12:15 P.M.
- **Section 004:** Monday, April 24, 12:30 P.M. – 2:30 P.M.

Unless otherwise stated, the final exam will cover all of the material from the semester. As with the previous exams, you may not use any written or electronic materials (e.g. notes, textbooks, or calculators) on the final exam.

Grading

Your overall numerical grade will be computed as follows:

Assignment	Total %
Homework	7
Quizzes	8
Lowest exam	10
Other exams	$15\% \times 3 = 45$
Final exam	30
Total	100

Your final numerical grade will be computed according to this table using only the listed assignments. In particular, there is no "extra credit" available in this course, nor will there be a "curve" applied to any assignments.

Your numerical grade will be converted to a final letter grade according to the following chart. These grade cutoffs are firm—there will be no curve applied to the overall grades.

Numerical	Letter
90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
Below 60	F

Course Policies

Canvas

You must activate your Canvas account and check it regularly. You can activate your account and log in at `https://www.uttyler.edu/canvas`. If you are registered for the course, then you should already have access to the Canvas page. All announcements and important documents will be posted there.

Email

Along with the built-in Canvas messaging system, the preferred means of communication for this course is official UT Tyler email. If you email me, it needs to be sent from your Patriots account to my UT Tyler email address (`slalonde@uttyler.edu` – note that this is **not** a Patriots address). In the event that I need to contact you, I will send an email to your Patriots account, and I will assume that you have read any such message.

Office Hours

I have regularly scheduled office hours, which are set aside as time for you to talk to me about the course. Attending office hours should be your first course of action if you find that you are struggling. You should not be afraid to come ask me questions when you are studying or working on homework. This course moves quickly—*don't let yourself fall behind*. If you are unable to attend my scheduled office hours, you can always set up an appointment or ask questions via email.

I am happy to answer questions about homework problems in office hours, and you should attend and talk to me if you're having trouble. However, I expect you to put a reasonable amount of thought into the problems before coming to me. In particular, office hours are not simply times to sit down and do your homework in front of me.

Attendance

You should plan to attend class every day unless you are ill or you have a university-recognized obligation. Attendance is not officially part of your grade, but poor attendance will affect your grade indirectly by impacting your performance on exams and quizzes. This class moves quickly, so it will be difficult for you to succeed in this course if you do not keep up with the material.

In the event that you do miss class, you are responsible for catching up on the material that was covered that day. You are also responsible for any announcements made in class.

Make-up Policy

Make-ups for exams will only be granted in the case of severe illness, excused absences that are required as part of a UT Tyler obligation, or for religious observances. You need to notify me as soon as possible (or at least one week ahead of time in the case of a planned absence) and provide appropriate documentation. Makeups or extensions on quizzes will be granted only in extreme cases and at the discretion of the instructor. Makeups will not be granted after the fact **under any circumstances**.

Mathematics Learning Center (MLC)

The math department hosts a drop-in tutoring center located in RBN 4021. It is staffed by mathematics graduate students, as well as some advanced undergraduates. It will be open most days throughout the semester, starting with the second week of classes. The MLC is an excellent resource for obtaining extra, on-demand help with your lower-level math classes.

Supplemental Instruction and PASS Tutoring

There will be weekly Supplemental Instruction (SI) sessions for Calculus I, which will be led by Ashlynn Cable. The meeting times and locations for the SI sessions will be posted on Canvas once they have been determined.

In addition, the PASS Tutoring Center will hold tutoring sessions in LIB 401 most days throughout the semester, beginning on January 16. The schedule can be found at

> `https://www.uttyler.edu/tutoring/schedule/`

and a copy of the schedule will be available on Canvas once it is finalized. Online tutoring is also available via Upswing.

Cell Phones, Calculators, and Electronic Devices

When class is about to begin, place any electronic devices (e.g., cell phones) in silent mode and put them out of sight. You may use a laptop or tablet to take notes or consult the textbook (if you have the electronic version). If you are using these devices for other purposes, I will ask you to put them away. No calculators of any kind are allowed on exams.

Plagiarism and Academic Dishonesty

Any work you submit must represent your own effort. If I determine that this is not the case, I will prosecute plagiarism and academic dishonesty to the fullest possible extent.

- All quizzes and exams are closed book, with no books, notes, or calculators allowed. You may not give help to or receive help from your classmates, and you should not expect help from the instructor aside from clarification of exam problems.

- You may not use online calculators (such as WolframAlpha, Symbolab, Mathway, etc.) or homework help sites (such as Chegg) to solve homework problems for you. Submitting a solution obtained from one of these services constitutes cheating and will be dealt with accordingly.

- Finally, you are forbidden from posting any documents or resources from this course (notes, assignments, solutions, etc.) to any third-party websites (such as Chegg or Coursehero). If I find that materials have been posted to any such website, I will treat it as a case of academic misconduct and deal with it accordingly.

Any violation of these rules will be considered a case of academic misconduct, which may result in a score of zero on one or more assignments and referral to the UT Tyler Office of Student Conduct and Intervention for further action.

Changes to Syllabus

I reserve the right to make changes to the syllabus during the semester. Any changes to course policies will be announced in class, and an updated version of the syllabus will be posted to Canvas.

Important Dates

- **January 9:** Classes begin.

- **January 16:** Martin Luther King, Jr. holiday. No class.

- **January 23:** Census date. Last day to change schedule or file for grade replacement.

- **March 13–18:** Spring break. No classes.

- **March 23:** Last day to withdraw.

- **April 24:** Final exam.

University Policies

Information on University policies concerning the following topics:

- UT Tyler Honor Code
- Students Rights and Responsibilities
- Campus Carry
- UT Tyler Tobacco-Free Policy
- Grade Replacement/Forgiveness and Census Date
- State-Mandated Course Drop Policy
- Student Accessibility and Resources
- Student Absence due to Religious Observance
- Student Absence for University-Sponsored Events and Activities
- Social Security and FERPA Statement

- Emergency Exits and Evacuation
- Student Standards of Academic Conduct
- UT Tyler Resources for Students

can be found at

https://www.uttyler.edu/academic-affairs/files/syllabuspolicy.pdf

Tentative Daily Schedule

This schedule is subject to change as we move through the semester, though we should follow it pretty closely (barring any unforeseen circumstances). The main topic is listed for each class day, together with the corresponding textbook sections from OpenStax *Calculus* (denoted by **O**) and Stewart's *Essential Calculus* (denoted by **S**). It would be beneficial to read the appropriate sections before coming to class each day.

	Date	Topics covered	Textbook
	1/9	Overview of the course. Review of functions.	**O** §1.1–1.2, **S** §1.1–1.2
1	1/11	Review of trigonometric, exponential, and logarithmic functions.	**O** §1.3–1.5, **S** §3.1–3.2
	1/13	Preview of calculus and introduction to limits. **Quiz 1.**	**O** §2.1–2.2, **S** §1.3
	1/16	Martin Luther King, Jr. holiday – no class.	
2	1/18	One-sided limits, infinite limits, and vertical asymptotes.	**O** §2.2, **S** §1.3, 1.6
	1/20	Limit laws and techniques for computing limits. **Quiz 2.**	**O** §2.3, **S** §1.4
	1/23	More techniques for computing limits.	**O** §2.3, **S** §1.4
3	1/25	Continuity.	**O** §2.4, **S** §1.5
	1/27	The precise definition of a limit. **Quiz 3.**	**O** §2.5, **S** §1.3
	1/30	Derivatives and rates of change.	**O** §3.1, **S** §2.1
4	2/1	The derivative as a function.	**O** §3.2, **S** §2.2
	2/3	**Exam 1**	
	2/6	Basic differentiation rules.	**O** §3.3, **S** §2.3
5	2/8	The product and quotient rules.	**O** §3.3, **S** §2.4
	2/10	Derivatives of trigonometric functions. **Quiz 4.**	**O** §3.5, **S** §2.3–2.4
	2/13	The chain rule.	**O** §3.6, **S** §2.5
6	2/15	Derivatives of inverse functions.	**O** §3.7, **S** §3.2, 3.5
	2/17	Implicit differentiation. **Quiz 5.**	**O** §3.8, **S** §2.6
	2/20	Derivatives of exponential and logarithmic functions.	**O** §3.9, **S** §3.3
7	2/22	Derivatives of hyperbolic functions. Logarithmic differentiation.	**O** §3.9, 6.9, **S** §3.3, 3.6
	2/24	**Exam 2.**	
	2/27	Applications of derivatives in the sciences.	**O** §3.4, **S** §3.4
8	3/1	Related rates.	**O** §4.1, **S** §2.7
	3/3	Linear approximations and differentials. **Quiz 6.**	**O** §4.2, **S** §2.8
	3/6	Maximum and minimum values.	**O** §4.3, **S** §4.1
9	3/8	The Mean Value Theorem.	**O** §4.4, **S** §4.2
	3/10	How derivatives affect the shape of a graph I. **Quiz 7.**	**O** §4.5, **S** §4.3
10		Spring Break – no classes.	

11	3/20	How derivatives affect the shape of a graph II.	**O** §4.5, **S** §4.3
	3/22	Limits at infinity and horizontal asymptotes. Sketching the graph of a function.	**O** §4.6, **S** §1.6, 4.4
	3/24	**Exam 3.**	
12	3/27	Optimization.	**O** §4.7, **S** §4.5
	3/29	Indeterminate forms and l'Hôpital's rule.	**O** §4.8, **S** §3.7
	3/31	Newton's method. **Quiz 8.**	**O** §4.9, **S** §4.6
13	4/3	Antiderivatives.	**O** §4.10, **S** §4.7
	4/5	Approximating areas and distances.	**O** §5.1, **S** §5.1
	4/7	The definite integral. **Quiz 9.**	**O** §5.2, **S** §5.2
14	4/10	Properties of definite integrals.	**O** §5.2, **S** §5.3
	4/12	The Fundamental Theorem of Calculus.	**O** §5.3, **S** §5.3–5.4
	4/14	**Exam 4.**	
15	4/17	Evaluating integrals using the Fundamental Theorem.	**O** §5.4, **S** §5.3–5.4
	4/19	Substitution.	**O** §5.5, **S** §5.5
	4/21	More on substitution. **Quiz 10.**	**O** §5.6–5.7, **S** §5.5
	4/24	**Final Exam**	