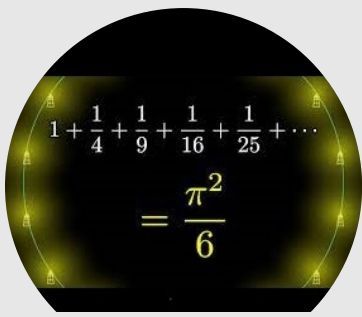




Calculus II

Math 1172 Winter 2025

Instructor Info —



Dr. Sergio Zapata



szapata1@lakeheadu.ca



Office Location

External office unit #3 T3-D



Student Hours

Mon 2:20 pm - 3:20 pm

Wed 2:20 pm - 3:20 pm

Course Info —



Class Times

Mon & Wed 3:30 pm - 5:00 pm



Class Location

K325

Lab Info —



Lab Time

Wednesday 5 pm - 6 pm



Location

A115

Welcome!

Welcome to Math 1172. As your instructor, I'm excited to have you in my class this semester and hope to get to know you well during our time together. For many of us, this class may at times feel like a struggle, but know that you are not alone and have a whole community that includes myself and your classmates as resources that can help support your success. Other resources on campus are discussed in more detail later in the syllabus. In our classroom, diversity and individual differences are respected, appreciated, and recognized as a source of strength. Students in this class are responsible for creating an environment where everyone feels welcome to speak up and participate during class and where carefully and respectfully listening to each other is the norm.

Material

Required Text

G. Strang and E. Herman, Calculus. Volume 2. Houston, TX: OpenStax College, 2016. This is a free, open-source textbook that you can access at <https://openstax.org/details/books/calculus-volume-2>.

Course Website

This course uses a D2L site, on which grades and important course information will be posted. It is advisable to regularly visit this website to keep yourself updated on any changes and to access any resources related to the course. (The website can be found at www.mycourselink.lakeheadu.ca.)

Student Hours

If you have any questions or concerns about the course, or if there's something you're curious about or thinking through, please feel free to stop by my office during Student Hours. Sometimes talking things out aloud can help us make progress. If you can't make it during Student Hours, please send me an email to schedule a meeting time that works for you.

Assessments Descriptions

WebWork Assignments (10%)

Homework will be assigned every Friday via the online homework system WebWork. You will have until 11:59 pm ET on the next Friday to complete that week's assignment. Please note that late assignments will not be accepted, but your lowest assignment mark will be dropped when calculating your final grade.

Post-Class Explorations (15%)

Once you have a solid grasp of the basics, it is time to apply your knowledge to solve new and more challenging problems. You will be asked to complete one exploration problem roughly every week due on Sunday 11:59 pm. This activity is key to helping you develop your ability to think creatively and become a more independent learner.

Written In-Class Assessments (45%)

There will be three written in-class assessments. These are scheduled for January 29, February 19, and March 26, respectively. Each problem on a written assessment will measure mastery of one or more associated learning targets that describe the most important ideas in this class. See the "Learning Targets" page at the end of this syllabus for a list. Learning is a gradual process; your final grade per learning target will reflect your eventual mastery of each topic.

Final Exam (30%)

The final exam will be a three-hour cumulative exam, which will be scheduled by the registrar during the final examination period.

Grading

Assignments

Your grade for each lab will be computed based on the grade you achieve in the corresponding WebWork assignment. However, please note that failure to participate in a lab will result in a grade of 0, regardless of the grade you achieve in the corresponding WebWork assignment. All labs will be weighted equally.

Post-Class Explorations

The grade for each problem will be based on the correctness of your work and the quality of the communication in your writing. All problems will be weighted equally. You can make revisions and resubmit each problem once, provided your first submission shows partial evidence of understanding; the grade you obtain will replace your original grade. Revisions are due one week after I return your original work.

Written In-Class Assessments

There will be a total of three written in-class assessments throughout the term. Each problem on a written assessment will measure mastery of one or more associated learning targets that describe the most important ideas in this class. You will receive a grade per learning target. See the "Learning Targets" page at the end of this syllabus for a list. You will have three opportunities to demonstrate mastery of each learning target (with the exception of those learning targets covered during the final weeks of class):

- A reassessment (second attempt) will be scheduled (outside of class) after each of the three in-class assessments.
- Additional opportunities for reassessment (third attempt) will be scheduled during the final week of class.

Minimal partial credit will be given, yet this grading system allows you to learn from mistakes without penalties, as long as mastery of learning targets is shown over time. Only the results of your most recent attempt for each learning target will be taken into account when computing your grade. See the chart on the last page for details. To compute your final grade for this component, all learning targets will be weighted equally.

Course Description

This course is a continuation of Math 1171. Topics include techniques of integration; applications of the definite integral; improper integrals; infinite sequences and series; Taylor polynomials and Taylor series.

Learning Objectives

Students who complete this course should be able to

- Define and solve standard calculus problems involving hyperbolic functions and their inverses.
- Perform techniques of integration, including u-substitution, integration by parts, decomposition into partial fractions, and trigonometric substitution.
- Recognize and compute improper integrals.
- Apply integrals to concepts such as area, volume, and arc length.
- Manipulate infinite sequences and series.
- Apply tests of convergence and divergence.
- Find the interval of convergence for power series, manipulate power series within their intervals of convergence, and represent analytic functions as a Taylor series.

Class Schedule

We will adhere to the following schedule of topics to the best of our abilities. It may be subject to minor changes due to unforeseen delays.

Week	Topics	Textbook Sections
Week 1 Jan. 6-10	Hyperbolic Functions and Inverse Hyperbolic Functions	Lecture Notes
Week 2 Jan. 13-17	Differentiating and Integrating Hyperbolic Functions	2.9
Week 3 Jan. 20-24	Integration By Parts; Integrating Trigonometric Products	3.1, 3.2
Week 4 Jan. 27-31	Trigonometric Substitution; In-Class Assessment 1	3.3

Week 5 Feb. 3-7	Partial Fractions; Volumes of Revolution	3.4 2.2, 2.3
Week 6 Feb. 10-14	Arc Length; Improper Integrals	2.4, 3.7
Week 7 Feb. 17-21	In-Class Assessment 2	
Week 8 Feb. 24-28	Study Week	
Week 9 March 3-7	Sequences; Infinite Series	5.1, 5.2
Week 10 March 10-14	The Divergence and Integral Tests; Comparison Tests	5.3, 5.4
Week 11 March 17-21	Alternating Series; Ratio and Root Tests	5.5, 5.6
Week 12 March 24-28	Power Series and Functions; In-Class Assessment 3	6.1, 6.2
Week 13 March 31- April 4	Taylor and Maclaurin Series	6.3, 6.4

Course Policies

- Any email sent to the instructor must include a properly descriptive subject line that consists of the course number followed by a very brief phrase that summarizes the subject of your message.
- For privacy reasons, I will not respond to emails from non-lakeheadu.ca addresses.
- Response times may vary depending on the volume of emails received. It is your responsibility to ensure you raise your concerns in a timely manner.
- Course content created by a faculty member is considered the faculty member's intellectual property; it should not be distributed, shared in any public domain, or sold by a student or other third party without prior written consent of the faculty member.
- Re-marking Policy. A student who believes an individual item of work has been incorrectly or unfairly marked may ask the person who marked it for a re-evaluation. With evidence to back their appeal, students should make such requests as soon as reasonably possible after receiving the work back, but no later than 2 weeks after it was returned.
- The assessment scheme outlined in this syllabus is subject to change at any point during the term. All important announcements/adjustments will be communicated via D2L. Please check it regularly. Not having read or seen an announcement is not an accepted reason for not following guidelines or missing deadlines.

Accommodations

Lakehead University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you think you may need accommodations, you are strongly encouraged to contact Student Accessibility Services (SAS) and register as soon as possible. For more information please visit: <http://studentaccessibility.lakeheadu.ca>

Lakehead-Georgian Policies

Academic and Student Code of Conduct Policies

- Academic and student policies and procedures for those enrolled in the Lakehead-Georgian programs can be found on the Lakehead-Georgian Student Portal.

- All Lakehead-Georgian programs will follow the Lakehead Regulations as list in the Lakehead University Academic Calendar (<http://csdc.lakeheadu.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&loaduserredits=False>). The University Regulations include but are not limited to Registration, Examinations, Reappraisals and Academic Appeals, Special Examinations, Academic Misconduct, Withdrawal, and Timely Feedback. Additional Faculty Regulations may also apply. Please review the Academic Calendar at <https://csdc.lakeheadu.ca/Catalog/ViewCatalog.aspx>.
- The Lakehead University Student Code of Conduct - Academic Integrity will apply to all Lakehead-Georgian students regardless of campus of study (<https://www.lakeheadu.ca/students/student-life/student-conduct>).
- The Lakehead University Student Code of Conduct - Appeals will apply to all Lakehead-Georgian students regardless of campus of study (<https://www.lakeheadu.ca/students/student-life/student-conduct>).
- The Georgian College Student Code of Conduct will apply to the Lakehead-Georgian students studying at the Barrie campus (<http://www.georgiancollege.ca/student-code-of-conduct>). Additional campus policies of Sexual Violence Procedure and Protocol (<https://www.georgiancollege.ca/about-georgian/campus-safety-services/tab/sexual-violence>), Alcohol, Drugs and Tobacco (<https://www.georgiancollege.ca/about-georgian/campus-safety-services/tab/alcohol-drugs-and-tobacco>), and Information Technology Acceptable Use Procedure (<http://www.georgiancollege.ca/wp-content/uploads/2-117IT-acceptable-use.pdf>) also apply.
- The Lakehead University Student Code of Conduct – Non-Academic will apply to the Lakehead-Georgian students studying at the Orillia campus (<https://www.lakeheadu.ca/students/student-life/student-conduct>).

Plagiarism and academic dishonesty

A breach of Academic Integrity is a serious offence. The principle of Academic Integrity, particularly of doing one's own work, documenting properly (including use of quotation marks, appropriate paraphrasing and referencing/citation), collaborating appropriately, and avoiding misrepresentation, is a core principle in university study. Students should view the Student Code of Conduct -Academic Integrity (<https://www.lakeheadu.ca/students/student-life/student-conduct>) for a full description of academic offences, procedures when Academic Integrity breaches are suspected and sanctions for breaches of Academic Integrity.

Student Services and Support

Student Advisors - <https://georgiancollege.sharepoint.com/sites/student/Student-Services/StudentAdvisors/SitePages/Home.aspx>

- Help students build both academic and personal resilience so that they can flourish at Georgian and beyond.
- Provide individual, group and web-based advising sessions.
- Are housed within the academic areas.
- To book an appointment with your advisor go to the Student Portal (preferred) or call 705-728-1968 Ext. 1307

Library - <http://library.georgiancollege.ca/main>

Customer Service

- Off campus access.

Research help

- Help finding books, articles and credible sources.
- Using specialty databases.
- Creating a search strategy.

Academic Success - <https://library.georgiancollege.ca/help/contact-academic-success>

Writing Centre - http://library.georgiancollege.ca/writing_centre

- Improve your writing.
- Help with citing sources and laying out your paper.

Math Centre - http://library.georgiancollege.ca/math_centre

- Make sense of math questions.
- Understand concepts and develop skills.

Tutors - <http://library.georgiancollege.ca/tutoring>

- Further understand course content.
- Build your study practices.

Accessibility Services - <https://www.georgiancollege.ca/student-life/student-services/accessibility-services>

If you are a student experiencing a disability who may require academic accommodations and have not yet registered with Accessibility Services, please contact their office at 705-722-1523, email studentsuccess@georgiancollege.ca, or visit their offices in B110. You must be registered with Accessibility Services to access academic accommodations. Support for those students whose success at college may be affected by a disability include:

- Ongoing support from our Accessibility Advisors including arranging a confidential psychoeducational assessment where required.
- Training in the use of specialized computer technology. Classroom and test accommodations.

Testing Services - <http://www.georgiancollege.ca/student-life/student-services/testing/>

- Accommodated testing.
- Missed/Makeup testing.
- Proctoring services are also available for external and Ontario Learn exams Counselling (<http://www.georgiancollege.ca/student-life/student-services/counselling/>).
- Free, confidential counselling is available to all students.
- Walk in counselling is available on a daily basis Monday to Friday.

Career Success - <http://www.georgiancollege.ca/student-life/student-services/co-op-and-career-services/>

- Career assessments and exploring options.
- Job search workshops.
- Labour market information.
- Resume/cover letter help.
- Interview practice.
- Graduate employment information.

Campus Safety and Security Syllabus Addendum

Emergency Evacuation - <https://www.georgiancollege.ca/about-georgian/campus-safety-services/tab/fire>

- Evacuate buildings when a fire alarm is activated or an official announcement is given. Review evacuation guidelines (<https://www.georgiancollege.ca/about-georgian/campus-safety-services/tab/fire>).
- Students requiring assistance in emergency situations must inform their faculty during the first week of class.
- Familiarize yourself with all fire exit doors of classrooms and buildings you may occupy.
- Do not re-enter a building until instructions are given by the Fire Department or college personnel.

Lockdown - <https://www.georgiancollege.ca/about-georgian/campus-safety-services/tab/lockdown>

- Lockdown is initiated when there is a potential or actual violent incident on campus that could result in a serious injury or threat to life.
- Students can download the new Safe@Georgian app to stay updated on Campus Safety and Security information including lockdown.
- Familiarize yourself with the College Lockdown procedure (<https://www.georgiancollege.ca/wp-content/uploads/Lockdown.pdf>).
- Lockdown tests occur each semester.

Resources

- Get Out, Hide, Fight Lockdown Video (<http://youtu.be/JA8cckMbVDk>).
- Lockdown quick reference sheet (http://www.georgiancollege.ca/wp-content/uploads/COM-15-416_LockdownProcedure_Signage_FVR3_print.pdf).
- Lockdown Model – Get Out, Hide, Fight: Lockdown Tools and Tactics and FAQs.

Unscheduled Campus Closure - <https://www.georgiancollege.ca/about-georgian/campus-safety-services/tab/campus-closures>

Resources

- How to find out if your campus is closed (<http://www.georgiancollege.ca/about-georgian/campus-safety-services/#how-to-find-out-if-your-campus-is-closed>)
- Unscheduled Campus Closure Procedure <https://www.georgiancollege.ca/wp-content/uploads/2-102Unscheduled-college-closure-2018.02.10.pdf>

Timing of Closures/Notification

Closure	Decision	Communication/ Notification	Notes
College has made the decision to close a campus or location in the morning	6:00 a.m.	By 6:30 a.m.	If re-opening for noon or evening classes is being considered, this will be mentioned in the message
College closed a campus(s) in the morning and expects to re-open by 12:00 noon	9:30 a.m.	By 10:00 a.m.	Only affects classes beginning at 12 noon or later
Closure expected to continue past 12:00 noon	9:30 a.m.	By 10:00 a.m.	
College intends to re-open for evening classes which commence at 5 p.m. or later	2:30 p.m.	By 3:00 p.m.	
College intends to NOT re-open for evening classes	2:30 p.m.	By 3:00 p.m.	

Notification will be made via:

- Georgian social media (Facebook, Twitter)
- Safe@Georgian app
- Georgian website (homepage)
- Recorded message when you call into Barrie campus at 705-728-1968
- Student or employee portal
- Georgian email account
- Radio and television announcements through local and regional media

Note. We only announce the names of campuses that are closed. If your campus is not named in a closure, it's open.

Learning Targets

- HF1 ☐ Simplify expressions involving hyperbolic functions and their inverses.
- HF2 ☐ Solve equations involving hyperbolic functions and their inverses.
- HF3 ☐ Differentiate functions involving hyperbolic functions and their inverses.
- HF4 ☐ Integrate functions involving hyperbolic functions.
- IT1 ☐ Use integration by parts to compute integrals.
- IT2 ☐ Compute trigonometric integrals.

- IT2 ☐ Use a trigonometric substitution to compute an integral.
- IT3 ☐ Use partial fractions to compute integrals.
- AP1 ☐ Compute the volume of a solid of revolution.
- AP2 ☐ Compute the arclength of a curve given by a function.
- AP3 ☐ Evaluate improper integrals.
- IT4 ☐ Identify an appropriate integration technique and use it to evaluate an integral.

- SS1 ☐ Determine whether a sequence is convergent or divergent. Find the limit of convergent sequences.
- SS2 ☐ Explain what it means for a series to converge or diverge. Determine if simple series, e.g. geometric series or p -series, converge.
- SS3 ☐ Use the integral test, comparison test, and/or the limit comparison test to determine if a series converges.
- SS4 ☐ Use the ratio and root tests to determine if a series converges.
- SS5 ☐ Explain the difference between conditional and absolute convergence. Use the alternating series test to determine if a series converges.
- SS6 ☐ Identify an appropriate convergence test to determine the convergence or divergence of a series.