

Calculus 1000A – Calculus I

Fall/Winter 2022-2023

Course Outline

1. Course Information

Course Name: Calculus I
Course Number: CALC 1000A
Academic Term: FW22

Prerequisites: Ontario Secondary School MCV4U or Mathematics 0110A/B

Antirequisites: Calculus 1500A/B, the former Calculus 1100A/B, Applied Mathematics 1413.

Unless you have either the requisites for this course or written special permission from your dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Your Instructors

Students must use their Western (@uwo.ca) email addresses when contacting their instructors and put “CALC 1000A” in the subject line in addition to other identifiers. Feedback on calculus should be sought through office hours, in tutorial, or via the math help centre. Remember to check announcements and the FAQ on our OWL page before contacting the course coordinator or your instructor. Issues related to the business of a given tutorial should be directed to the instructor associated to that tutorial before involving the course coordinator. Instructors will endeavor to reply to student queries within five business days, although response times may be longer depending on the volume of emails received. It is your responsibility to ensure you raise your concerns in a timely manner.

Dr. Steven Amelotte (011, 019)
Postdoctoral Fellow
Dept. of Mathematics
Office: MC 119
Email: samelot@uwo.ca

Dr. Blake Boudreaux (012,
020)
Postdoctoral Fellow
Dept. of Mathematics
Office: MC 121
Email: bboudre7@uwo.ca

Jarl Flaten (015, 023)
PhD Candidate
Dept. of Mathematics
Office: MC 275F
Email: jtaxers@uwo.ca

Dr. Asghar Ghorbanpour (007, 022)
 Assistant Professor
 Dept. of Mathematics
 Office: MC 134
 Email: aghorba@uwo.ca

Dr. Natalia Kiriushcheva (004, 005, 008, 014)
 Assistant Professor
 Dept. of Mathematics
 Office: MC 264
 Email: nkiriush@uwo.ca

Dr. Mohsen Mollahajiaghahi (006, 021)
 Assistant Professor
 Dept. of Mathematics
 Office: TBA
 Email: mmollaha@uwo.ca

Dr. Khoa Nguyen (009, 017)
 Assistant Professor
 Dept. of Mathematics
 Office: MC 282
 Email: knguyen@uwo.ca

Dr. Rasul Shafikov (016, 018)
 Professor
 Dept. of Mathematics
 Office: MC 112
 Email: shafikov@uwo.ca

Mohabat Tarkeshian (002, 003)
 PhD Candidate
 Dept. of Mathematics
 Office: MC 275A
 Email: mtarkesh@uwo.ca

Dr. James Uren [coordinator]
 Program Coordinator
 School of Math and Stat Sci
 Office: MC 125
 Phone: TBA
 Email: juren2@uwo.ca

Office hours: Each instructor will offer weekly in-person consultation time and the details can be located on the OWL page associated to our course. It is important that you check OWL regularly for updates/changes to the scheduling of these times.

Section	Dates	Time	Room	Instructor
LEC 200 ONLINE	Asynchronous	N/A	N/A	N/A
Lecture/Tutorial (TUT 002)	Monday/Wednesday	12:30pm – 1:30pm	SSC-2032	Tarkeshian
Lecture/Tutorial (TUT 003)	Monday/Thursday	1:30pm – 2:30pm	B&GS-0153	Tarkeshian
Lecture/Tutorial (TUT 004)	Monday/Wednesday	1:30pm – 2:30pm	MC-105B	Kiriushcheva
Lecture/Tutorial (TUT 005)	Monday/Wednesday	9:30am – 10:30am	B&GS-0153	Kiriushcheva
Lecture/Tutorial (TUT 006)	Monday/Wednesday	8:30am – 9:30am	SSC-2024	Mollahajiaghahi
Lecture/Tutorial (TUT 007)	Monday/Wednesday	7:00pm – 8:00pm	MC-105B	Ghorbanpour
Lecture/Tutorial (TUT 008)	Monday/Wednesday	11:30am – 12:30pm	B&GS-0153	Kiriushcheva
Lecture/Tutorial (TUT 009)	Monday/Wednesday	10:30am – 11:30am	HSB-240	Nguyen
Lecture/Tutorial (TUT 010)	Monday/Wednesday	6:30pm – 7:30pm	SSC-2024	TBA
Lecture/Tutorial (TUT 011)	Tuesday/Thursday	8:30am – 9:30am	B&GS-0153	Amelotte
Lecture/Tutorial (TUT 012)	Tuesday/Friday	12:30pm – 1:30pm	SSC-2036	Boudreaux

Lecture/Tutorial (TUT 013)	Wednesday/Friday	1:30pm – 2:30pm	B&GS-0153	TBA
Lecture/Tutorial (TUT 014)	Tuesday/Thursday	1:30pm – 2:30pm	MC-105B	Kiriushcheva
Lecture/Tutorial (TUT 015)	Tuesday/Thursday	9:30am – 10:30am	B&GS-0153	Flaten
Lecture/Tutorial (TUT 016)	Tuesday/Friday	8:30am – 9:30am	SSC-2024	Shafikov
Lecture/Tutorial (TUT 017)	Monday/Wednesday	8:30am – 9:30am	SSC-2028	Nguyen
Lecture/Tutorial (TUT 018)	Tuesday/Friday	11:30am – 12:30pm	MC-105B	Shafikov
Lecture/Tutorial (TUT 019)	Tuesday/Thursday	10:30am – 11:30am	MC-105B	Amelotte
Lecture/Tutorial (TUT 020)	Tuesday/Thursday	7:00pm – 8:00pm	SSC-2024	Boudreaux
Lecture/Tutorial (TUT 021)	Tuesday/Thursday	8:30am – 9:30am	SSC-2028	Mollahajiaghaei
Lecture/Tutorial (TUT 022)	Monday/Wednesday	5:30pm – 6:30pm	SSC-2028	Ghorbanpour
Lecture/Tutorial (TUT 023)	Tuesday/Thursday	8:30am – 9:30am	SSC-2032	Flaten

Extra Help: The Mathematics Department runs free in-person and virtual help centres each week day during the semester, starting Monday September 19th. Our help centre is located in the Math-Physics Accelerator in PAB 48/49/26 (on the lower level of the Physics and Astronomy Building.) These help centres are staffed by graduate student teaching assistants and all first-year mathematics courses are supported. No appointments are necessary.

Information about our help centre and other departmental supports for students can be found at:

https://www.uwo.ca/math/undergraduate/current_students/Help%20Centre.html

3. Course Description

Review of limits and derivatives of exponential, logarithmic, and rational functions. Trigonometric functions and their inverses. The derivatives of the trig functions and their inverses. L'Hospital's rules. The definite integral. Fundamental Theorem of Calculus. Simple substitution. Applications of integration, including areas of regions and volumes of solids of revolution.

Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Compute the limits of functions at a point or at infinity using methods of algebra, limit laws, and related concepts.

2. Define the notion of continuous function and be able to determine if a given function is continuous using limits or other theorems.
3. Explain the role of limits in the definition of derivatives and integrals, and how the ideas of continuity, differentiability, and integrability are related to one another.
4. Compute derivatives and integrals of various algebraic, trigonometric, exponential, and logarithmic functions.
5. Deduce properties of the graph of a function from its derivatives and apply these concepts to solve optimization problems.
6. Apply the idea of the definite integral to compute areas between curves.

Course Content Schedule

Week	Dates	Topic	OpenStax Reference Sections
1	Sept 8 – 9	Introduction and Review	1.1, 1.2
2	Sept 12– 18	Exponential, Trigonometric, and Inverse functions	1.3, 1.4, 1.5
3	Sept 19- 25	Limits and Continuity	2.2, 2.3, 2.4
4	Sept 26 – Oct 2	Limits at infinity/The Derivative	4.6, 3.1, 3.2
5	Oct 3 – 9	Derivative as a Function/Differentiation Rules	3.2, 3.3, 3.5, 3.7
6	Oct 10 – 16	The Chain Rule/Implicit Differentiation	3.6, 3.8
7	Oct 17 – 23 (MIDTERM Oct 21)	Derivatives of Logarithmic Functions/Related Rates	3.9, 4.1
8	Oct 24 – 30	Maximum and Minimum Values/Relationship Between Derivatives and the Shape of the Graph	4.3, 4.5
9	Oct 31 – Nov 6	Reading Week	N/A
10	Nov 7 – 13	Optimization Problems/L'Hospital's Rules and Indeterminate Forms	4.7, 4.8
11	Nov 14 – 20	Antiderivatives/Sigma Notation	4.10, 5.1
12	Nov 21 – 27	The Definite Integral/Fundamental Theorem of Calculus	5.2, 5.3
13	Nov 28 – Dec 4	Simple Substitution/Areas Between Curves	5.4, 5.5, 5.6, 6.1
14	Dec 5 – 8	Volumes/Review	6.2

**The above schedule is *tentative*, and minor adjustments may be made as the course progresses.

Other Important Dates

Classes begin: September 8, 2022.

Reading Week: October 31 – November 4, 2022.

Last day to drop a first term class without penalty: November 12, 2022.

Classes end: December 8, 2022.

Study Day: December 9, 2022.

Exam Period: December 12-23, 2022.

COVID Contingency plan

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining TUT sessions will be delivered entirely online via Zoom. The times for these synchronous meetings will coincide with those listed in the timetable. The course content will continue to be delivered asynchronously via OWL. The nature of the quizzes and homework assignments will remain the same. The grading scheme will **not** change. Any remaining tests will also be conducted online using remote proctoring and on a platform determined by the course staff—likely gradescope.

4. Course Materials

Required Text:

Calculus: Volume 1, by Gilbert Strang and Edwin “Jed” Herman (OpenStax, 2016) – Access for free at <https://openstax.org/books/calculus-volume-1/pages/1-introduction>

Optional Additions:

CLP Calculus 1 and 2, by Joel Feldman, Andrew Rechnitzer, and Elyse Yaeger (UBC 2018) – Access for free at <https://secure.math.ubc.ca/~CLP/>

Students are responsible for checking the course OWL site (<http://owl.uwo.ca>) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class.

All course material will be posted to OWL: <http://owl.uwo.ca>.

If students need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Technical Requirements

Students will be required to purchase a license for the Mobius online assessment platform. The cost of this license is approximately 30 CAD. There are no other additional costs required. Purchases can be made through links provided in OWL during the second week of classes. **When registering your license make sure to use your @uwo.ca email address and have your Student ID ready.** Deferred payment options may be available. Licenses cannot be purchased after December 9, 2022.

Gradescope (<https://www.gradescope.ca/>) will be used as a grading platform for written work in the course. A free account will be created on your behalf, although you will be required to verify the

account and change the password during the first week of class. Details regarding the set-up of your account and the submission requirements for your written work will be posted on OWL. It is the responsibility of the student to ensure their homework assignments are submitted in the correct format (PDF or PNG.) Submitting work in an improper format may result in your work not being graded, and this cannot form the basis of a regrade request. Additionally, the two term tests may be scanned by the course staff and uploaded to Gradescope for grading and viewing.

Additionally, students will need regular access to:

- a laptop or computer;
- a stable internet connection;
- a working microphone and webcam;
- to have installed recent versions of Chrome AND Firefox browsers, a pdf reader, and Zoom on their computer;
- a device for scanning (either a scanner or an app that can be used in conjunction with your device's camera).

Students without reliable access to YouTube must install an mp4 player on their computer so they may view video lessons. An up-to-date browser like Chrome will likely satisfy this requirement.

5. Methods of Evaluation

Calculus 1000A is a blended course with asynchronous online delivery of lecture material and course content. Students are expected to attend lectures by completing various activities (reading prescribed sections of the text or completing video lessons, for example), although you are permitted to schedule these activities during a given week in a way that is personally optimal. A list of suggested exercises from the OpenStax will be provided in OWL to supplement the weekly lessons. All of the evaluations (homework, quizzes, the midterm test, and exam) for Calculus 1000A are based on the course material distributed in this manner.

Additionally, your instructor will host in-person tutorial sessions each week to review and expand on the lesson(s) from the week. These meetings may take the form of a supplementary lecture, problem session, or a discussion, depending on the week, but will always be scheduled to conclude within your allotted tutorial time. Attendance will not be taken but is expected.

The overall course grade will be calculated as listed below:

Assessment	Format	Weighting	Date
Submitted Homework	Online, asynchronous, via Gradescope	Four equally weighted written assignments totaling 16% of final grade.	Assignments and due dates are available on OWL. The first assignment will be posted on

			Sept 16 th and due Sept 29 th .
Quizzes	Online, asynchronous, via Mobius	Eight equally weighted short assessments totaling 12% of final grade.	Due dates are posted on OWL, with the first quiz open during the week of Sept 12 th .
Midterm Test	In-person	32%	Friday October 21, 7pm until 9pm.
Final Exam	In-person	40%	TBA (3 Hours)

- The midterm test will be 120 minutes in duration and will consist of a mixture of short answer and multiple-choice-style questions. *This will be a closed book test.*
- The make-up midterm is tentatively scheduled for Thursday October 27th, 7-9pm.
- The final exam will be cumulative, 180 minutes in duration, and will consist of a mixture of short answer and multiple-choice-style questions. *This will be a closed book exam.*

6. Student Absences

Academic Consideration for Student Absences

Students who experience an extenuating circumstance (illness, injury or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

- (i) For work worth less than 10% of the total course grade (a quiz or homework assignment) your TUT instructor is empowered to grant academic considerations without the need to contact counselling. To seek accommodations for work totaling less than 10% of your course grade (a quiz or an assignment, for example) please send an email to your TUT instructor in a timely manner.
- (ii) For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.
- (ii) Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

Missed assessments can only be excused through one of the mechanisms above. In all cases, students are required to contact their instructors within 24 hours of the end of the period covered, unless otherwise instructed in the course outline.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or

for other reasons. **All documentation required for absences must be submitted to the Academic Counselling office of a student's Home Faculty.**

For the policy on Academic Consideration for Student Absences – Undergraduate Students in First Entry Programs, see:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf

and for the Student Medical Certificate (SMC), see:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

Accommodated Evaluations

Missing a quiz, the midterm test, the final exam, or the due date of a submitted homework assessment will result in a grade of zero unless appropriate permission is sought and granted. In the case of quizzes and homework assignments your mark will be re-weighted to exclude the missed assessment. In the case of a missed midterm test, a makeup test will be arranged. If a student misses the midterm test and the corresponding makeup test and has appropriate permission for both, then the final exam will be re-weighted to include the weight of the missed term test.

Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

6. Accommodation and Accessibility

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf,

7. Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

The use of calculators and other electronic devices during the term tests or final exam is prohibited.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Computer-marked multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

In the event of a health lock-down tests and examinations in this course will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at:

<https://remoteproctoring.uwo.ca>.

8. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at (519) 661-2147 if you have any questions regarding accommodations.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Students who are in emotional/mental distress should refer to Mental Health@Western (<http://www.health.uwo.ca/mentalhealth>) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.