Western Science

Department of Mathematics

CALCULUS 1000A – Course Outline – FW 2023-24

1. Course Information

Course Name: Calculus I
Course Number: CALC 1000A
Academic Term: FW23

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's Designate (Department/Program Counsellors and Science Academic Counselling) 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.

Section	Dates	Time	Room	Instructor
LEC 001	M, W, Th, F	8:30am – 9:30am	MC-110	T. Barron
LEC 002	M, W, Th, F	12:30pm – 1:30pm	WSC-55	A. Ghorbanpour
LEC 003	M, W, Th, F	1:30pm – 2:30pm	NCB-113	N. Kiriushcheva
LEC 004	M, W	7:00pm – 9:00pm	NCB-113	TBA
LEC 005	Tu, Th	7:00pm – 9:00pm	SH-3345	K. Nguyen
LEC 006	M, W, Th, F	1:30pm – 2:30pm	WSC-55	B. Boudreaux
LEC 007	M, W, Th, F	11:30pm – 12:30pm	HSB-40	N. Kiriushcheva
LEC 008	M, Tu, W, Th	4:30pm – 5:30pm	SSC-2050	M. Mollahajiaghaei
LEC 009	M, W, Th, F	3:30pm – 4:30pm	MC-110	P. Yu
LEC 010	M, Tu, Th, F	8:30am – 9:30am	SH-3345	TBA
LEC 011	M, F	2:30pm – 3:30pm	MC-110	B. Nasserden
LEC 011	Tu, Th	2:30pm – 3:30pm	NSC-1	B. Nasserden

2. Instructor Information

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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 lecture, or via the math help centre. Remember to check announcements on our OWL page before contacting your instructor or the course coordinator. Issues related to the business of a given lecture section should be directed to the instructor associated to that section 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.

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.

Extra Help: The Mathematics Department runs free in-person and virtual help centres each weekday 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 Syllabus, Schedule, Delivery Mode

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 7 – 8	Introduction and Review	1.1, 1.2
2	Sept 11– 17	Exponential, Trigonometric, and Inverse functions	1.3, 1.4, 1.5
3	Sept 18- 24	Limits and Continuity	2.2, 2.3, 2.4
4	Sept 25 – Oct 1	Limits at infinity/The Derivative	4.6, 3.1, 3.2
5	Oct 2 – 7	Derivative as a Function/Differentiation Rules	3.2, 3.3, 3.5, 3.7
6	Oct 10 – 15	The Chain Rule/Implicit Differentiation	3.6, 3.8
7	Oct 16 – 22	Derivatives of Logarithmic Functions/Related Rates	3.9, 4.1

	(MIDTERM Oct 20)		
8	Oct 23 – 29	Maximum and Minimum Values/Relationship Between Derivatives and the Shape of the Graph	4.3, 4.5
9	Oct 30 – Nov 5	Reading Week	N/A
10	Nov 6 – 12	Optimization Problems/L'Hospital's Rules and Indeterminate Forms	4.7, 4.8
11	Nov 13 – 19	Antiderivatives/Sigma Notation	4.10, 5.1
12	Nov 20 – 26	The Definite Integral/Fundamental Theorem of Calculus	5.2, 5.3
13	Nov 27 – Dec 3	Simple Substitution/Areas Between Curves	5.4, 5.5, 5.6, 6.1
14	Dec 4 – 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 7, 2023
Fall Reading Week: October 30 – November 5, 2023
Classes end: December 8, 2023
Exam period: December 10 – 22, 2023

Contingency Plan

Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will **not** change. Any assessments affected will be conducted online as determined by the course instructor.

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

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 WebAssign online assessment platform. There are no other additional required costs associated to this course. Purchases can be made through links provided in OWL during the second week of classes. Please do not purchase a WebAssign account via any other method. ***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 8, 2023.

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 term test may be scanned by the course staff and uploaded to Gradescope for grading and viewing.

Additionally, students will need:

- 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 documents to upload to Gradescope (either a scanner or an app that can be used in conjunction with your device's camera).

5. Methods of Evaluation

Calculus 1000A is an in-person lecture-based course. Students are expected to attend all classes. 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 covered in weekly lectures.

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.	The four assignments will be due on Oct 6th, Oct 26th, Nov 16th, Dec 7th, respectively.
Quizzes	Online, asynchronous, via WebAssign	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 18th.

Midterm Test	In-person	32%	Friday October 20, 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, covering the course material from weeks 1-6, inclusive. *This will be a closed book test and no electronic devices or aids of any other kind will be permitted.*

- The make-up midterm is tentatively scheduled for Thursday October 26th, 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 and no electronic devices or aids of any other kind will be permitted.*

6. 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. If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

Assessments worth less than 10% of the overall course grade:

For work worth less than 10% of the total course grade (a homework assignment, for example) your LEC 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 please send an email to your LEC instructor as soon as you are able to do so.

Please 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. If your request for considerations requires supporting documents, as in the case of medically-based requests, then **all documentation required must be submitted to the Academic Counselling office of your Home Faculty, regardless of the weight of the assessment.**

Assessments worth 10% or more of the overall course grade:

For work totalling 10% or more of the final course grade, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at

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

The Student Medical Certificate is available at

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

Missing a test or the due date of a submitted homework assessment or quiz will result in a grade of zero unless appropriate permission is sought and granted. In the case of homework assignments and quizzes

your other homework or quiz marks will be re-weighted to exclude the missed assessment. In the case of a missed midterm, a common makeup test will be arranged. If a student misses the midterm and the corresponding makeup midterm 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).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

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 are encouraged to contact Accessible Education, 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 their official university address is attended to in a timely manner.

No electronic devices or aids of any other kind are permitted for use during the midterm or the final exam.

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.

In the event of a health lockdown or other circumstances that prevent in-person operations, 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/.

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

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

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

http://academicsupport.uwo.ca/accessible_education/index.html

if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (https://learning.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.

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/.

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