Calculus 1000B Course Outline

1. Course Information

Calculus 1000B, Winter Term, Year 2022 – 2023

Section	Dates	Time	Room	Instructor
Lecture (LEC 200) ONLINE	Asynchronous	N/A	N/A	N/A
Tutorial (TUT 002)	Tuesday/Thursday	8:30 am – 9:30 am	SSC-2032	M.Mollahajiaghaei
Tutorial (TUT 003)	Monday/Wednesday	8:30 am – 9:30 am	SSC-2028	M.Mollahajiaghaei
Tutorial (TUT 004)	Monday/Wednesday	7:00 pm – 8:00 pm	MC-105B	A.O'Hara
Tutorial (TUT 005)	Monday/Wednesday	8:00 pm – 9:00 pm	MC-105B	A.O'Hara
Tutorial (TUT 006)	Monday/Wednesday	12:30 pm – 1:30 pm	SSC-3022	N.Kiriushcheva
Tutorial (TUT 007)	Tuesday/Thursday	12:30 pm – 1:30 pm	SSC-2032	N.Kiriushcheva

Contingency plan for an in-person class pivoting to 100% online learning

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, affected course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

List of Prerequisites

Pre-requisites   Ontario Secondary School MCV4U or Mathematics 0110A/B
Anti-requisites   The former Calculus 1100A/B, Calculus 1500A/B, Applied Mathematics 1413.

Senate policy on prerequisites: 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. Instructor Information

Instructors	Email	Office	Office Hours
Dr. Natalia Kiriushcheva (Course Coordinator)	nkiriush@uwo.ca	MC 264	TBA[*]
Dr. Allen O'Hara	aohara@uwo.ca	MC 113	TBA[*]
Dr. Mohsen Mollahajiaghaei	mmollaha@uwo.ca	MC 128	TBA[*]

[*]**Office hours:** a schedule will be posted at the course page on OWL, extra office hours may be arranged by appointment.

Email policy

Any email should be sent from the university account (@uwo.ca) and contains "**Calculus 1000B, TUT Section number 00X**" in **the subject line.** Any email without this, and/or any email sent from other than a UWO email address, risks being directed to spam, deleted unread, or otherwise going missing.

3. Course Syllabus, Schedule, Delivery Mode

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

Important Dates

Classes Start	Reading Week	Classes End	Study day(s)	Exam Period
January 9	February 18 - 26	April 10	April 11-12	April 13 – 30

* March 7, 2022: The last day to drop a second-term half course or a second-term full course without penalty.

Learning Outcomes

Upon successful completion of this course, you 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.

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

Optional:

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/

Single Variable Calculus: Early Transcendentals by James Stewart, Daniel K. Clegg, and Saleem Watson – Available as eBook and in printed format

Midterm Tests and Final Exams for Calculus 1000A/B (Custom Course Materials) – Available as eBook and in printed format

Course Content Schedule (Tentative)

Week	Dates	Topic	Text Reference Sections
1	January 9 – 13	Introduction, Review of Functions, Trigonometric Functions	1.1, 1.2, 1.3
2	January 16 – 20	Inverse Functions, Inverse Trigonometric Functions, Exponential and Logarithmic Functions	1.4, 1.5
3	January 23 – 27	Limits and the Limit Laws, Continuity	2.2, 2.3, 2.4
4	Jan 30 – Feb 3	Intermediate Value Theorem, Limits at Infinity and Infinite Limits, Definition of a Derivative	2.4 (cont.), 4.6, 3.1

5	February 6 – 10	The Derivative as a Function, Differentiation Rules, Derivatives of Trigonometric Functions, The Chain Rule	3.2, 3.3, 3.4, 3.5, 3.6
6	February 13 – 17	Derivatives of Inverse Functions, Implicit Differentiation, Derivatives of Logarithmic and Inverse Trigonometric Functions	3.7, 3.8, 3.9
7	February 18 – 26	Reading Week	
8	Feb 27 – Mar 3	Related rates, Maxima and Minima	4.1, 4.3
9	March 6 – 10	Relationship Between Derivatives and the Shape of the Graph, L'Hospital's Rules and Indeterminate Forms	4.5, 4.8
10	March 13 – 17	Optimization Problems, Antiderivatives, Sigma Notation, Approximating Areas	4.7, 4.10, 5.1
11	March 20 – 24	The Definite Integral and Properties of Definite Integrals, The Fundamental Theorem of Calculus, The Net Change Theorem	5.2, 5.3, 5.4
12	March 27 – 31	The Substitution Rule, Integrals Involving Exponential and Trigonometric Functions	5.5, 5.6
13	April 3 – 6, 10	Areas Between Curves, Volumes	6.1, 6.2

**The above schedule is *tentative*, and minor adjustments may be made as the course progresses. Additionally, weekly lessons (including video lecture content and supplemental notes) and suggested exercises corresponding to the various sections of our required text are posted on the OWL site for the course.

Course Design and Expectations

Calculus 1000B is started with both synchronous and asynchronous 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 some of activities during a given week in a way that is personally optimal. A list of suggested exercises from the text will be provided to supplement the weekly lessons. The evaluations (quizzes, assignments, test, and exam) for Calculus 1000B are based on the course material distributed in this manner.

Students are responsible for checking the course OWL site (http://owl.uwo.ca) on a regular basis for news and updates. Any changes will be indicated on the OWL site and discussed with the class.

If you need assistance, seek support on the [OWL Help page](). Alternatively, you can contact the [Western Technology Services Helpdesk](). They can be contacted by phone at 519-661-3800 or ext. 83800.

[Google Chrome]() or [Mozilla Firefox]() are the preferred browsers to optimally use OWL; update your browsers frequently. Students interested in evaluating their internet speed, please click [here.]()

Technical Requirements for the Course

- Laptop or computer
- Stable internet connection
- Working microphone
- Working webcam
- Device for scanning (either a scanner or an application that can be used in conjunction with your device's camera).

5. Methods of Evaluation

Below is the summary of graded assessments in Calculus 1000B. Any deviations from this schedule will be communicated and the schedule should be considered tentative until confirmed.

Assessment	Format	Weighting	Date
Quizzes	Online, asynchronous	Equally weighted assessments totaling 10% of the course grade	Weekly (10 the best quizzes out of 11 will be counted)
Assignments	Online, asynchronous	Equally weighted assessments totaling 15% of the course grade	3 assignments in total
Midterm Test	In-person, synchronous	30%	Friday, March 3, 7 – 9 PM
Final Exam	In-person, synchronous	45%	TBA (during the exam period)

Click [here]() for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.

A+ 90-100   One could scarcely expect better from a student at this level

A   80-89   Superior work which is clearly above average

B   70-79   Good work, meeting all requirements, and eminently satisfactory

C	60-69	Competent work, meeting requirements
D	50-59	Fair work, minimally acceptable
F	below 50	Fail

Other Information About Tests and Examinations:

- The midterm test and final exam will be run in-person. Virtual proctoring will be employed on the midterm test and the final exam if the course will be run online, otherwise, the test and final exam will be held in classrooms.

- The midterm test will be 120 minutes in duration and will consist of a mixture of short answer and multiple-choice-style questions. *These will be a closed book test.*

- The final exam will be 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.*

- For multiple choice components of tests and the exam: use may be made of software to check for unusual coincidences in answer patterns that may indicate academic integrity violations.

- The use of calculators and communication devices (except of what will be indicated in test and exam instructions) during the test and final exam **is prohibited**.

- Missing a test, the final exam, or the due date of a submitted assignment will result in a grade of zero unless appropriate permission is sought and granted. In that case, your mark may be re-weighted, or a makeup evaluation may be arranged.

Communication and Participation

- Students are responsible for monitoring the OWL site(s) for the course and should aim to check for updates every day or two.
- Important updates and announcements will be provided via OWL.
- The course staff will monitor email regularly and reply as promptly as possible, and all students are required to do the same.
- Students are strongly encouraged to post questions about the lessons or homework on the site forum.
- Each week you should endeavor to fully complete the lessons before your tutorials.

Other Helpful Suggestions:

- Success in undergraduate mathematics requires some self-direction and independence. In addition to routine practice, students should set aside time each week to try and generate and review their own questions about the course material.

- Try and take notes of your own or work out examples (as though you were in an in-person lecture) when you complete the weekly lessons. Try to be as active as possible when reading or viewing course content.
- Always remember to ask questions frequently. If you are struggling with the material, contact your instructor (or teaching assistant(s)).

6. Student Absences

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, i.e., for assignments and quizzes, you may ask your instructor for a one- or two-days extension in case of illness or other legitimate reasons. For prolonged illness or other circumstances, you should provide valid medical or supporting documents to the Academic Counselling Office. In such a case, if a period of accommodation covers most of time assignment for an assessment, you might be granted an excuse from a quiz or assignment and reweighting of the remaining assessments. Note that this policy can not be applied for the midterm test and final examination.

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.

If a student is granted an academic accommodation from the Academic Counselling Office, then the student will be eligible to take a make-up midterm test of final exam.

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).

Note: missed work can *only* be excused through one of the mechanisms above. Being asked not to attend an in-person course requirement due to potential COVID-19 symptoms is **not** sufficient on its own.

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.

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.

The Remote Proctoring Software may be used in this course, including in the event of health lock-down. In such a case, the midterm test and final examination 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/.