Western Science

Department of Mathematics
Calculus 1000B – Calculus I

Winter Term, Year 2021 - 2022
Course Outline

Course Information

Instructors:
Dr. Michael Francis mfranc65@uwo.ca
Dr. Asghar Ghorbanpour aghorba@uwo.ca
Dr. Natalia Kiriushcheva (course coordinator) nkiriush@uwo.ca

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.

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*	N.Kiriushcheva
Tutorial (TUT 003)	Monday/Wednesday	8:30 am – 9:30 am^	SSC-2024*	N.Kiriushcheva
Tutorial (TUT 004)	Monday/Wednesday	7:00 pm – 8:00 pm^	SSC-2024*	M.Francis
Tutorial (TUT 005)	Monday/Wednesday	8:00 pm – 9:00 pm^	SSC-2024*	M.Francis
Tutorial (TUT 006)	Monday/Wednesday	12:30 pm – 1:30 pm^	MC-105B*	A.Ghorbanpour
Tutorial (TUT 007)	Tuesday/Thursday	12:30 pm – 1:30 pm^	SSC-2028*	A.Ghorbanpour

*These rooms are reserved in case if the tutorial sessions will be moved to in-person format.

^In case of online format of the course delivery, the tutorials will be run at these time intervals via Zoom.

Please note that we will deliver our course in the online format until, at least, January 31, 2022, therefore it is essential that each student has access to the technology that will allow to learn the course material from online sources, attend Zoom tutorial sessions, and use the Proctortrack for the midterm test and final exam (if necessary).

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).

We will continue to follow public health guidance and will adjust the course accordingly: move to in-person classes or continue online learning.

Course Syllabus

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.

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.

Important Dates

Classes Start	**Reading Week**	**Classes End**	**Study day(s)**	**Exam Period**
January 10	February 19 - 27	April 8	April 9	April 10 – 30

* March 14, 2021: The last day to drop a second-term half course or a second-term full course without penalty.

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

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.

Text and Resources

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

Course Design and Expectations

Calculus 1000B is started as online course 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.

Course Content Schedule (Tentative)

Week	Dates	Topic	Text Reference Sections
1	January 10 - 14	Introduction, Review of Functions, Trigonometric Functions	1.1, 1.2, 1.3
2	January 17 - 21	Inverse Functions, Inverse Trigonometric Functions, Exponential and Logarithmic Functions	1.4, 1.5
3	January 24 - 28	Limits and the Limit Laws, Continuity	2.2, 2.3, 2.4
4	Jan 31 – Feb 4	Intermediate Value Theorem, Limits at Infinity and Infinite Limits, Definition of a Derivative	2.4 (cont.), 4.6, 3.1
5	February 7 - 11	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 14 - 18	Derivatives of Inverse Functions, Implicit Differentiation, Derivatives of Logarithmic and Inverse Trigonometric Functions	3.7, 3.8, 3.9
7	February 19 - 27	Reading Week	
8	Feb 28 – Mar 4	Related rates, Maxima and Minima	4.1, 4.3
9	March 7 - 11	Relationship Between Derivatives and the Shape of the Graph, L'Hospital's Rules and Indeterminate Forms	4.5, 4.8
10	March 14 - 18	Optimization Problems, Antiderivatives, Sigma Notation, Approximating Areas	4.7, 4.10, 5.1
11	March 21 - 25	The Definite Integral and Properties of Definite Integrals, The Fundamental Theorem of Calculus, The Net Change Theorem	5.2, 5.3, 5.4

12	Mar 28 – April 1	The Substitution Rule, Integrals Involving Exponential and Trigonometric Functions	5.5, 5.6
13	April 4 - 8	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.

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 9% of the course grade	Weekly (9 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	Online or in-person, synchronous	31%	Friday, March 4, 7 – 9 PM
Final Exam	Online or 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:

- 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 closed book tests.*

- 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 of the previous week so that you are well prepared for 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)).

Professionalism and Privacy

Western students are expected to follow the Student Code of Conduct. Additionally, the following expectations and professional conduct apply to this course:

- Students are expected to follow online etiquette expectations provided on OWL.
- All course materials created by the instructor(s) are copyrighted and cannot be sold/shared.
- Recordings are not permitted (audio or video) without explicit permission.
- Permitted recordings are not to be distributed.
- Students will be expected to take an academic integrity pledge before some assessments.
- All recorded sessions will remain within the course site.

Western Academic Policies and Statements

Absence from Course Commitments

Policy on Academic Consideration for Student Absences

In the interest of the health and safety of students and health care providers, you are no longer required to seek a medical note for absences this term. If you are unable to meet a course requirement due to illness you should use the Illness Reporting Tool. This tool takes the place of the need to submit a medical note and the Self-Reported Absence System formally used by undergraduate students.

Remote Proctoring Statement

Tests and examinations in this course, in case of continued online mode, will be conducted using the remote proctoring service Proctortrack. 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**. More information about this remote proctoring service is available in the Online Proctoring Guidelines at the following link:
https://www.uwo.ca/univsec/pdf/onlineproctorguidelines.pdf

Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. Information about the technical requirements are available at the following link:
https://www.proctortrack.com/tech-requirements/

Accommodation for Religious Holidays

The policy on Accommodation for Religious Holidays can be viewed here.

Special Examinations

A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents. To provide an opportunity for students to recover from the circumstances resulting in a Special Examination, the University has implemented Special Examinations dates. These dates as well as other important information about examinations and academic standing can be found here.

Academic Offenses

"Scholastic offences are taken seriously, and students are directed here to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Accessible Education (AE) at 661-2111 x 82147 for any specific question regarding an accommodation or review The policy on Accommodation for Students with Disabilities.

Correspondence Statement

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. You can read about the privacy and security of the UWO email accounts here.

Other Academic Policies and Statements

Copyright and Audio/Video Recording Statement

All of the remote learning sessions for this course will be recorded. The data captured during these recordings may include your image, voice recordings, chat logs and personal identifiers (name displayed on the screen). The recordings will be used for educational purposes related to this course, including evaluations. The recordings may be disclosed to other individuals participating in the course for their private or group study purposes. Please contact the instructor if you have any concerns related to session recordings.

Participants in this course are not permitted to record the sessions, except where recording is

an approved accommodation, or the participant has the prior written permission of the instructor.

Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws. You must always ask permission to record another individual and you should never share or distribute recordings.

Course Requisites Statement

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will 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.

Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop 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 Student Accessibility Services (SAS) 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/mental_health) 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.