CALC 1501B - Calculus II
for Mathematical and Physical Sciences
Winter 2025
Course Outline

1. Course Information

There are 4 lectures per week. These lectures may take the form of a supplementary lesson, problem session, or a discussion, depending on the week. A list of suggested exercises from the textbook will be provided in OWL to supplement the weekly lectures.

OWL Website: Both sections (001 and 002) share the same OWL website: **CALC 1501B 001 FW25.**

Prerequisites: A minimum mark of 60% in one of Calculus 1000A/B, Calculus 1500A/B, Numerical and Mathematical Methods 1412A/B, the former Applied Mathematics 1412A/B.

Antirequisites: Calculus 1301A/B, Numerical and Mathematical Methods 1414A/B, the former Applied Mathematics 1414A/B, the former 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 Advisors) 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

Course Staff:

Dr. Martin Pinsonnault
[Section 001]
Associate Professor
Dept. of Mathematics
Office: MC 132
Email: mpinson@uwo.ca

Dr. Asghar Ghorbanpour
[Section 002]
Assistant Professor
Dept. of Mathematics
Office: MC 135
Email: aghorba@uwo.ca

Office hours: Each instructor will offer weekly consultation times. The details will appear on the OWL page associated to the course.

Email Communication with Instructors

If you have questions you can email your instructor. **Your email must comply with the following rules:**

- You must use your **UWO email address**.
- You must include "**CALC 1501B**" in the email title.
- You must include your **full name** as it appears on your UWO id in the body of the message.
- You must include your **student number** in the body of the message.
- **Never reply directly to an announcement email** sent from the OWL website.

Not following any these rules may create confusion and may result in unexpected delays.

Feedback on calculus should be sought through office hours, in class, or via the math help centre. Remember to check announcements on our OWL page before contacting your instructor. Instructors will endeavour to reply to student enquiries 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.

3. Course Description and Learning outcomes:

Students who intend to pursue a degree in Mathematics, Applied Mathematics, Statistics, Actuarial Sciences, Physics or Astronomy should take this course. The main topics are:

- Review of integration and continuity.
- The Intermediate Value Theorem, the Extreme Value Theorem, the Mean Value Theorem and their consequences.
- Mathematical induction.
- Techniques of integration (substitution, integration by parts, trigonometric integral, trigonometric substitutions, partial fractions).
- Constructing new functions using integration.
- Improper integrals, the Gamma function.
- Sequences, convergence, the Monotone Convergence Theorem.
- Series, Geometric series, Taylor series, applications.
- Parametric curves with applications.
- Polar coordinates.
- First order linear and separable differential equations with applications.

Differences between CALC 1501B and CALC 1301B:

CALC 1301B and CALC 1501B introduce students to elementary integration techniques, sequences, and series. However, CALC 1501B also covers **topics** that are not discussed in CALC 1301, and **a special attention is given to definitions, theorems, and their logical dependence**. At the end of CALC 1501B, students should be able to:

- give rigorous definition of limits and continuity,
- use mathematical induction in simple arguments,
- state and use some important theorems such as the Intermediate Value Theorem, the Extreme Value Theorem, the Mean Value Theorem, the Fundamental Theorem of Calculus, the Fundamental Theorem of Algebra, and the Monotone Convergence Theorem,
- give the rigorous definition of definite integrals in terms of upper and lower sums,
- define rigorously some transcendental functions as logarithms, exponentials, and the Gamma function,
- use simple integration techniques (substitution, integration by parts, trigonometric formulae, partial fractions) to find antiderivatives of standard elementary functions,
- solve first order, separable or linear, initial value problems,
- represent standard elementary functions as power series and address their convergence,
- use the notions seen in class to solve various problems, and to learn how to assemble them logically in order to prove some elementary mathematical statements.

Key Sessional Dates

- Jan. 6 : Classes resume
- Jan. 14 : Last day to add or drop a second-term half course without showing WDN
- Feb. 15–23 : Spring Reading Week (including Family Day)
- Mar. 30 : Last day to withdraw from a second-term half course without academic penalty
- Apr. 4 : Last day of classes in the Winter term
- Apr. 5-6 : Study Days
- Apr. 7-30 : April examination period
- Apr. 18, 20 : Good Friday and Easter Sunday

4. Course Materials

Required Text:

- *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/

Optional Additions:

Single Variable Calculus: Early Transcendentals (9th edition), by James Stewart (Cengage/Brooks Cole). This is another text sometimes used for first year calculus. While it is not required that you have access to this text, some students may benefit from an additional resource. The text is currently in its 9th edition.

Online platforms used in the course

Learning Management System (OWL) : All course material will be posted to OWL:
http://owl.uwo.ca

Students are responsible for checking the course OWL site (https://westernu.brightspace.com/) regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

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.

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 weeks 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 PDF format. 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.

WebWork will be used for weekly quizzes. These assignments are individualized and should be submitted online. The deadline for the assignments is strictly enforced. A free account will be created on your behalf. The login link will be posted on OWL together with more information on the system.

WebWork is a free open-source platform. For more information on WebWork see
https://webwork.maa.org/wiki/Student_Information

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

Online WeBWorK Quizzes:	10%
Written Assignments:	20%
Midterm Test:	25%
Final Exam:	40%
Best of the Test and Exam:	5%

Remark : Note that **cellphones, calculators, cheat sheets, textbooks, and any other aids will NOT be allowed during examinations**. *Both midterm and the final exam will be closed book tests.*

Online WeBWorK Quizzes

The Online Webwork Quizzes are designed to practice basic calculation techniques and to provide quick feedback to students. Each quiz will contain problems from the material covered in the course after the previous quiz.

There will be 10 online WeBWorK quizzes that will be released weekly (except the week of the midterm test), starting in the 2nd week of the term. Each quiz will be open open for seven days; they will open on Monday morning and will close at midnight (11:55 p.m. EDT) on Sunday. Students can take the quiz any time during this window with no time limit. Students should aim to complete all quizzes by the posted deadline. We will leave the quizzes open for 48 hours after the deadline as a grace period with no late penalty.

Students will have more than one attempts to complete each quiz; the questions in each attempt will be randomly generated from question pools and may differ from the others'. Of these attempts, the highest mark will be recorded as the student's quiz grade. After **dropping the two lowest quiz marks**, each quiz will be counted equally in the final course grade.

Written Assignments

The assignments are designed to prepare students for the exams and to reinforce more conceptual aspects of the course. There will be four written assignments that will be released on the following schedule

- *First Assignment*: January 20th - February 2nd,
- *Second Assignment*: February 3rd - February 24th,
- *Third Assignment:* March 3rd - March 16th,
- *Fourth Assignment:* March 17th - March 30th.

The assignments submission will only accepted through gradescope. The assignments are due on a Sunday midnight (Eastern local time), however, we will accept the submissions for 48 hours after the deadline with no late penalty.

Midterm Test

The Midterm will be 120 minutes in duration and will consist of a mixture of short answer and multiple-choice-style questions. It will (approximately) cover the topics covered up to Friday Feb. 14th. The test will take place in-person on the following tentative schedule
Friday, February 28th, 7pm - 9pm
The location(s) of the test will be announced closer to the test date.

Makeup midterm test will be held **one week after** the scheduled midterms (+/- one day if necessary to avoid conflicts with other exams).

Final Exam

The final exam will be 180 minutes in duration, and will consist of a mixture of short answer and multiple-choice-style questions. It will cover **all the topics** seen in the course. The date and location(s) will be determined later by the Registrar.

The best of the test and the exam
> The remaining 5% of the course grade will be assigned to whichever of the midterm test and the final exam is the student's best mark.

General information about missed coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs* posted on the Academic Calendar: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf,

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult Accessible Education.

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage: https://registrar.uwo.ca/academics/academic_considerations/
All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course. However, the following assessment are excluded from this, and therefore always require formal supporting documentation:

- Examinations scheduled during official examination periods (Defined by policy)
- Midterm Test.

When a student *mistakenly* submits their one allowed Academic Consideration request **without supporting documentation** for the assessments listed above or those in the **Coursework with Assessment Flexibility** section below, the request cannot be recalled and reapplied. This privilege is forfeited.

Evaluation Scheme for Missed Assessments

Absence from Midterm Test
> If you miss a midterm test due to any circumstance, you must provide an academic consideration covering the date of the test. *As it is noted previously, students can not use their academic consideration without documentation for the midterm test.*

> Makeup examinations for the midterm tests will be available to those who are granted an academic consideration. In cases where a student misses to take the midterm test and the

makeup test only if they can provide an academic consideration for both absences, the weight of their test will be transferred to the final exam.

Absences from Final Examinations

When a student misses the Final Exam and their Academic Consideration has been granted, they will be allowed to write the Special Examination (the name given by the University to a makeup Final Exam). See the Academic Calendar for details (under [Special Examinations](#)), especially for those who miss multiple final exams within one examination period.

Coursework with Assessment Flexibility

By policy, instructors may deny Academic Consideration requests for the following assessments with built-in flexibility:

Missed or late Quizzes.

This course has 10 online quizzes, but **only the eight quizzes with the highest marks** are counted towards your final grade. Should extenuating circumstances arise, students do not need to request Academic Consideration for the **first 2** missed quiz. Academic consideration requests will be denied for the **first 2** missed quiz. Academic Consideration requests may be granted when students miss more than one quiz, and these additional (2nd, 3rd, 4th…) missed quizzes will be reweighted to the final exam.

Deadline with a No-Late-Penalty Period

Students should aim to complete all quizzes and submit the assignments by the posted deadline. However, we will leave them open for 48 hours after the deadline as a no late penalty period. No submission will be accepted after that 48-hour period as solutions will be made available to students.

Missed or late Assignements.

This course has 4 assignments. Students should aim to complete all quizzes and submit the assignments by the posted deadline. However, we will leave them open for 48 hours after the deadline as a no late penalty period. No submission will be accepted after that 48-hour period as solutions will be made available to students. Academic Consideration requests may be granted **after the no late penalty period is over**. If Academic Consideration is granted, the assignment will be reweighted to the final exam.

6. Additional Statements

Religious Accommodation

When conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible but not later than two weeks prior to the writing or the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university's EDID website for the recognized religious holidays:

https://www.edi.uwo.ca.

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.

Academic Policies
The website for Registrar Services is https://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.

Note that **cellphones, calculators, cheat sheets, textbooks,** and any other aids **will NOT** be allowed during examinations.

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:

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

In the event of 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.

Support Services
Please visit the Science & Basic Medical Sciences Academic Advising 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 Learning Development and Success (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/.